6. RECOMMENDED PROJECTS

6.1. INTRODUCTION

This chapter discusses capital project recommendations for Fremont's pedestrian network. These infrastructure improvements are intended to enhance pedestrian access and circulation as well as help pedestrians feel more comfortable when walking in Fremont.

A number of recommendations are made for infrastructure projects that should be implemented on a broad citywide basis. These projects were divided into eight major categories of improvements: Sidewalk Gaps, Curb Ramps, Signalized Intersections, Signal Timing, Unsignalized Intersections, District Streetscapes, Safe Routes to School, and Pathway Projects. As part of the project description, specific recommendations are made for prioritizing these improvements, so that the city can implement them in a logical manner based on the areas of greatest need first. Factors considered in the prioritization included areas with the greatest demand (e.g. the city's neighborhood districts, schools, and civic buildings), areas with the greatest risk for pedestrian collisions (high traffic arterials), areas with identified public input, and areas that were identified as high need through the fieldwork and inventory process.

Following the citywide project recommendations, a number of site-specific project recommendations are identified and shown with detailed project improvement plans. These projects seek to improve specific intersections, corridors, or other locations that were identified through the existing conditions and public input process as needed improvement areas. These project consist of consist of both infrastructure projects, as well as and programs. The implementation process requires that all pedestrian projects and programs be implemented through Fremont's Capitol Improvement Program process. This includes a public review process and project approval from the City Council. For implementation, projects and programs will also be evaluated for traffic impacts to the City's roadway network.

Cost estimates for the projects discussed in this chapter are shown in **Appendix B** of this plan. Total cost for implementing the capital improvements described in this Chapter is approximately $11.2 million.

Following the Recommended Projects chapter is a chapter that discusses programs and other non-infrastructure improvements that can enhance the walking experience in Fremont. Fremont can implement a variety of different programs through public awareness, education and enforcement that when combined with infrastructure improvements will likely increase the walking population.

Two examples of sidewalk gaps in Fremont

6.2. INFILL OF SIDEWALK GAPS

Sidewalk gaps are areas in Fremont where there are no sidewalks, or the sidewalk ends abruptly, resulting in a discontinuous network. Areas without sidewalks may force pedestrians to walk along the

edge of the roadway, or may cause pedestrians to cross at undesignated crossing locations. Providing a continuous pedestrian sidewalk along all of Fremont's roadways is recommended.

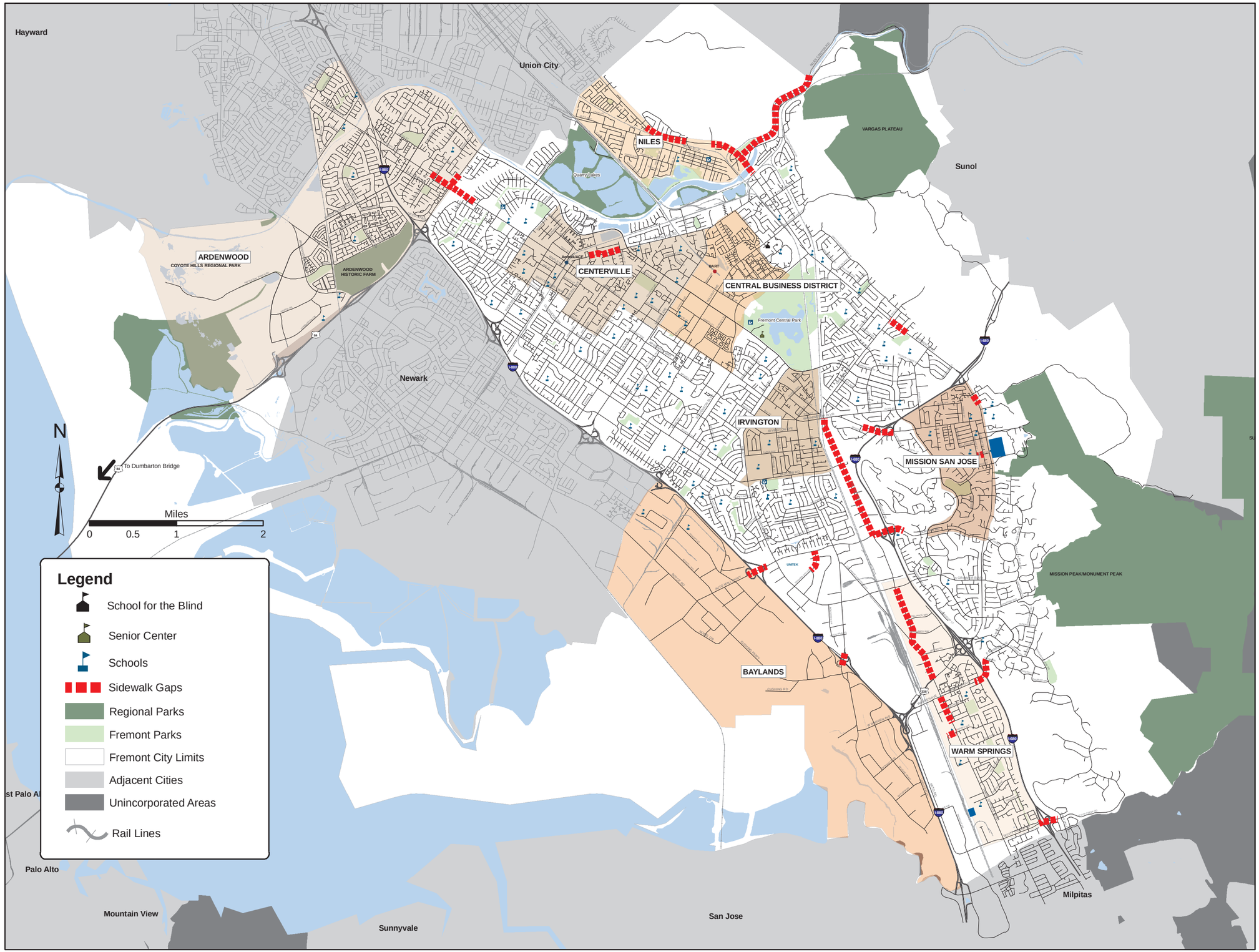
Although a complete citywide inventory of sidewalk gaps was not conducted as part of this plan, a general survey of sidewalk gaps along major roadways was done. The location of these major sidewalk gaps is shown in **Figure 6-1**, and listed in **Table 6-1** below. The city should conduct additional sidewalk inventory work in order to develop a detailed electronic inventory of sidewalk gaps needing to be installed.

Table 6-1:
Major Existing Sidewalk Gaps in Fremont

Street Name	North/West Limit	South/East Limit	Length
Auto Mall Parkway	Osgood Road	East of Sabercat Road	0.37
Auto Mall Parkway	I-880 Southbound on-ramp	I-880 Northbound on-ramp	0.24
Cedar Street	Bryant Street	Ellsworth Street	0.07
Decoto Road	Fremont Boulevard	East of Mount Palomar Court	0.15
E. Warren Avenue	Navajo Road	Yakima Drive	0.33
Fourier Avenue	Westinghouse Drive	Warm Springs Boulevard	0.11
Fremont Boulevard	West of Ferry Lane	East of Becerra Drive	0.60
Mission Boulevard	Mayhews Road	Alameda Creek Bridge	0.62
Mission Boulevard	Potel Terrace	Niles Underpass Road	0.49
Mission Boulevard	Mill Creek Road	Mission Creek	0.13
Mission Boulevard (Mission San Jose High School)	Driscoll Road	Callery CourtMiss San Jose High School	0.33
Niles Canyon Road	North of Old Canyon Road	Mission Boulevard	1.35
Osgood Road	Washington Boulevard	Auto Mall Parkway	1.47
Peralta Boulevard	Parish Circle	Arlene Court	0.37
S. Fremont/880	I-880 Northbound off-ramp	I-880 Southbound off-ramp	0.17
Scott Creek Road	I-680 Southbound ramps	Green Valley Road	0.22
Technology Drive	Auto Mall Parkway	Solar Way	0.25
Warm Springs Boulevard	E. Warren Avenue	Pontiac Way	0.34
Warm Springs Boulevard	S. Grimmer Boulevard	Mission Boulevard	1.18
Washington Blvd	Meredith Drive	Luzon Drive	0.36

RECOMMENDATION: As a first priority, Fremont should fill sidewalk gaps located along arterial streets, including gaps on Warm Springs Boulevard, Mission Boulevard, Auto Mall Parkway, Niles Canyon Road, South Fremont Boulevard, Washington Boulevard, South Fremont Boulevard, Decoto Road and Peralta Boulevard. As a second priority, Fremont should connect remaining sidewalk gaps on collector streets and neighborhood streets. **Appendix B-1** shows the estimated costs for installing sidewalks at the major gaps in Fremont.

Figure 6-1: Fremont Pedestrian Plan - Sidewalk Gaps & Project Areas



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6.3. REDUCTION OF CURB RADII

Past Fremont design standards called for wide curb radii at intersections. As a result, many of Fremont's intersections are considered large. This means that pedestrians have further to walk across the street than at intersections with small or medium turning radii and may result in pedestrians crossing at undesignated crossing locations. This design also allows vehicles to make right-turns at relatively high speeds compared to smaller intersections.

A wide curb radii at Mission Boulevard and Sullivan UNP Road

RECOMMENDATION: As a citywide policy, Fremont should consider reducing corner curb radii when determined by an engineering study. Fremont should also consider, where necessary, retrofitting curb radii at all 53 arterial and collector signalized intersections in the eight Planning Areas that are adjacent to commercial land uses. These locations are in **Appendix B-2**.

6.4. CURB RAMP IMPROVEMENTS

6.4.1. Curb Ramps

As discussed in Existing Conditions, an inventory of curb ramps was conducted for the Pedestrian Plan in the city's five historical districts and the Central Business District. This data collection determined that nearly all of Fremont's intersection corners have curb ramps. **Table 6-2** shows a list of locations within the survey area that currently lack curb ramps.

As part of the curb ramp inventory, data on the slope, side slope, landing dimensions, and other attributes of the curb ramp were measured in the field. An analysis of this data found that most of Fremont's curb ramps are not compliant with current ADA regulations for slope, particularly for slope of the flared sides, and presence of tactile warnings ("truncated domes"). ADA Guidelines have evolved over time, and most of Fremont's ramps were installed prior to the current version of the ADA guidelines, and were compliant at the time of installation. Retrofitting the cities non-compliant curb ramps is generally something the city will accomplish as part of roadway re-paving projects (ADA requires that curb ramps be installed or brought up to compliance during street overlays).

Table 6-2:
Pedestrian District Intersections without Curb Cuts or Curb Ramps

Intersection	Corners without Cut or Ramp
Niles Boulevard & Rock Avenue	1
Niles Boulevard & Hillview Drive	2
Niles Boulevard & Rancho Arroyo Parkway	3
Second Street & Hillview Drive	4
Bodily Avenue & Hillview Drive	4
Riviera Drive & Rancho Arroyo Parkway	4
Cuenca Way & Rancho Arroyo Parkway	4

RECOMMENDATION: As a first priority, Fremont should install curb ramps at all locations in the eight pedestrian districts where they currently do not exist. As a second priority, Fremont should

conduct a detailed curb ramp inventory of other city locations to determine other locations that lack curb ramps. Priority locations for additional inventory would include schools, neighborhood parks, and community centers. As part of normal street re-paving projects, the city should continue to install curb ramps if none currently exist, and to upgrade existing ramps to current standards.

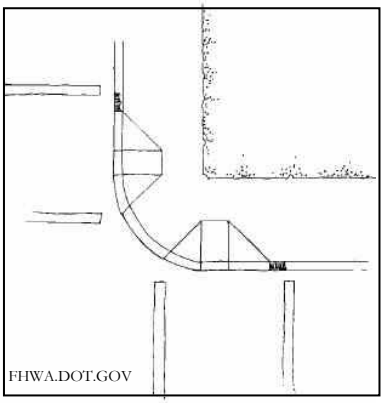
A curb ramp with truncated domes

6.4.2. Truncated Domes

Truncated domes provide a cue to visually-impaired pedestrians that they are entering a street or intersection. Since 2002 when new guidelines were implemented, ADA Guidelines have called for truncated domes on curb ramps. Most of Fremont's streets lack truncated domes, because they were constructed prior to 2002.

Although it is not required for Fremont to install truncated domes at existing curb ramps that were built prior to 2002, it is recommended that the city continue installing these devices at high priority pedestrian locations and when re-paving and upgrading existing curb ramps to meet ADA guidelines. Truncated domes are a very visible improvement, and they are relatively inexpensive to install.

RECOMMENDATION: Fremont should install truncated domes at all arterial/arterial and arterial/collector intersections that are adjacent to commercial land uses in the eight pedestrian districts, and at those intersections located within 0.25 miles of the California School for the Blind, Fremont Senior Center, and Ohlone College. This is approximately 50 intersection locations. See **Appendix B-3** for a list of these locations. Fremont should also install truncated domes when re-paving streets and improving existing curb ramps.



Perpendicular curb ramps

6.4.3. Perpendicular Curb Ramps

Perpendicular curb ramps are designed so two ramps are included at intersection corners. Perpendicular ramps allow pedestrians and people in wheelchairs to access the sidewalk perpendicular to stopped traffic, and to enter into the crosswalk directly in their line of travel. Perpendicular ramps are not required by ADA or any other standard, and the City of Fremont curb ramp standard is for a single diagonal ramp. However, perpendicular ramps are the preferred curb ramp style from a pedestrian standpoint since they provide the most direct access into the crosswalk. Perpendicular ramps do require more space to install than a single diagonal ramp, are more costly, and sometimes cannot be accommodated due to utilities or other obstructions at the corner. However, especially at major intersections in high pedestrian zones, it is recommended that they be installed where feasible.

RECOMMENDATION: For the first priority perpendicular curb ramps, Fremont should install perpendicular curb ramps at the 28 arterial/arterial intersections in the eight pedestrian districts. As a second priority, Fremont should install perpendicular curb ramps at the 18 arterial/arterial intersections outside of the pedestrian district boundaries. See **Appendix B-4** for a list of these locations.

6.5. SIGNALIZED INTERSECTION IMPROVEMENTS

There are a variety of engineering improvements that can improve pedestrians' walking experience when crossing signalized intersections. All of these improvements are discussed in detail in Appendix A - Design Guidelines. An improvement that is recommended for some of Fremont's signalized intersections is signal retiming. This improvement is described below.

6.5.1. Signal Timing

Signal timing is the amount of time each phase of a signal is allotted for vehicles to pass through or pedestrians to cross the street. Per the MUTCD, standard traffic engineering design assumes that pedestrians travel at 4.0-feet per second, which is used to determine the amount of time to assign to the pedestrian clearance interval. For slower pedestrians, such as the elderly and children, this assumed walking speed may result in them not being able to fully cross the street before the light changes. By adjusting the signal timing to a slower walking rate, slower pedestrian will have more time to cross the street.

RECOMMENDATION: If a traffic study determines, Fremont should consider adjusting signal timing at the 11 arterial/arterial and arterial/collector signals within 0.25 miles of elementary schools and senior centers to allow for a pedestrian pace of 2.8-feet per second. This slower walking speed is consistent with MUTCD recommendations for walking rates for slower pedestrians. Consideration of signal operation and signal coordination by the Transportation & Operations is necessary for this recommendation. **Appendix B-5** identifies the 11 signal locations.

6.5.2. Audible Signals

The City of Fremont has a project underway to assist visually impaired pedestrians cross streets at signalized locations. Accessible pedestrian signal devices will be installed on traffic poles at several Fremont intersections. The new accessible pedestrian signal devices provide information in non-visual formats, including audible tones, verbal messages, and tactile (vibrating) push buttons. By emitting a locator tone, a visually impaired person can find the push button to activate the pedestrian crosswalk. The device will also emit a tone or audible voice indicating the "walk" interval, and can be programmed for the direction of the crossing. A vibrating tactile directional arrow surface will indicate that the "walk" interval is active.

These new devices will initially be installed near activity locations such as shopping areas, senior housing areas, transit facilities, medical facilities, government facilities, parks and school locations.

RECOMMENDATION: Fremont should continue installing audible signals at signalized intersections within .5 miles of the California School for the Blind, Fremont Senior Center, Ohlone College, transit facilities, medical facilities, government facilities, and shopping areas. The City should also consider installing audible signals at the five-corners intersection of Bay Street/Fremont Boulevard/Union Street/Washington Boulevard due to its complexity for pedestrians. Appendix B-2 and B-6 identifies these intersections.

6.6. UNCONTROLLED CROSSWALK IMPROVEMENTS

Infrastructure improvements at uncontrolled crosswalk locations can help increase the visibility of pedestrians to motorists and improve the pedestrians' walking experience. These improvements are for

both unmarked and marked crosswalks at intersections. A list and description of all uncontrolled crosswalk improvements are discussed in Appendix A – Design Guidelines.

6.6.1. High-Visibility Crosswalk Markings

There are a variety of different striping styles for crosswalks. The City of Fremont utilizes two different marking styles for pedestrian crosswalks: the standard "transverse" style, consisting of two parallel lines; and the "ladder" style consisting of the two parallel lines with perpendicular ladder bars striped across the width of the crosswalk. Ladder style crosswalks are used in locations where heightened pedestrian visibility is important, such as around school areas. However, the city does not currently have a consistent policy to guide the application of ladder crosswalks.

RECOMMENDATION: As a citywide policy, Fremont should install ladder crosswalk markings at all uncontrolled crosswalk locations on arterials and collectors where there are existing tranverse style markings. A list of these locations is included in **Appendix B-7**. The city should also continue its policy of installing high-visibility ladder crosswalk markings at uncontrolled crosswalks on local streets adjacent to schools, on a case-by-case basis.

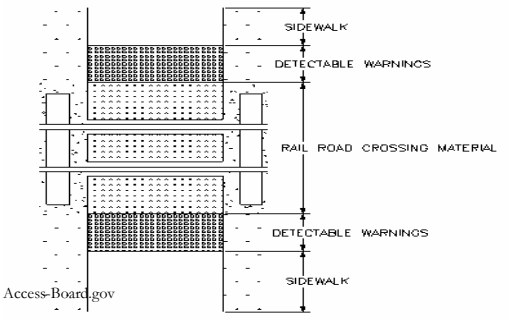
6.6.2. Curb Extensions

Curb extensions, also called "bulbouts" to describe their shape, are engineering improvements intended to reduce pedestrian crossing distance and increase visibility. In addition to shortening the crosswalk distance, curb extensions serve to increase pedestrian visibility by allowing pedestrians to safely step out to the edge of the parking lane where they can see into the street, also making them more visible to oncoming drivers. Despite their advantages, curb extensions can require major re-engineering of the street, can be extremely costly, and are not appropriate for all situations.

RECOMMENDATION: Fremont should consider the feasibility of installing curb extensions at crosswalk locations where appropriate.

6.6.3. Railroad Crossings

Fremont has several railroad lines with at-grade crossings. At-grade crossings are where trains cross the street at the same level as vehicles and pedestrians. Improvements such as signals, reorientation of sidewalks, and truncated domes placed at the crossing can help alert pedestrians of possible train traffic.



Pedestrian railroad crossing that meets ADA Guidelines

RECOMMENDATION: Fremont should install truncated domes at all pedestrian crossings of train tracks, including on Nursery Avenue, Dusterberry Way, Maple Street, Fremont Boulevard, Blacow Road, Clark Drive, Walnut Avenue, and Stevenson Boulevard. The City should also consider improvements such as gates, fences and other warning devices at locations with high pedestrian volumes.

6.7. DISTRICT STREETSCAPES

Streetscape improvements are described in Appendix A - Design Guidelines. For the Fremont Pedestrian Master Plan, streetscape improvements are determined by six of the districts' existing planning documents. **Table 6-3** shows a list of the districts and the plans referenced for these improvements. The Warm Springs and Mission San Jose plans do not include any specific projects.

Table 6-3:
Referenced Planning Documents for Streetscape Improvements

District	Planning Document	Sample Improvements
Centerville	Centerville Specific Plan	-Bulb outs on Fremont Boulevard between Thornton and Central Avenues
CBD	Central Business District Concept Plan	-Pedestrian Plaza on Capital Avenue between Fremont Boulevard and State Street -10-foot sidewalks on Fremont Boulevard between Mowry Avenue and Beacon
Irvington	Irvington Concept Plan	-Bay Street Streetscape & Parking Project -Bulb outs on Washington Avenue
Mission San Jose	Mission San Jose Design Guidelines and Regulations	-
Niles	Niles Concept Plan	-Raised Crosswalks on Niles Boulevard -Pedestrian Refuge Island on Mission Boulevard at Mayhews Road
Warm Springs	Warm Springs BART Area Specific Plan	-

RECOMMENDATION: Fremont should implement the pedestrian improvements included in the Specific Plans for the appropriate districts. These plans should be updated to reflect today's district projects and cost estimates.

6.8. SAFE ROUTES TO SCHOOL

Fremont has over 80 schools located throughout the city. Improvements at these locations could benefit school-aged children walking to and from school, in addition to improving conditions for all pedestrians improving the neighborhood. In the past, Fremont had an active residential traffic calming program. This program is currently unfunded but while there were funds available, the City installed speed lumps near many city schools.

In 2006, the Fremont City Council allocated $280,000 to a School Traffic Safety program that is currently being implemented. The money is for infrastructure improvements around Fremont elementary schools and a study is underway to develop a list of recommendations at and around Fremont elementary schools. These recommendations should be incorporated into the project list resulting from the Pedestrian Master Plan process and prioritized with the other improvements.

Areas surrounding Fremont's high schools and junior high schools also need evaluation. Providing easy and comfortable walking routes for these students will likely increase the number of older students walking to school.

RECOMMENDATION: Fremont should implement the school area pedestrian improvements that are an outcome as part of the School Traffic Safety Program. The City should also conduct a systematic evaluation of the roadway network around high schools and junior high schools and develop and Capital Improvement project list from the findings.

6.9. PATHWAY PROJECTS

There are several potential pedestrian pathway projects that could increase pedestrian activity in Fremont. Descriptions of these projects are included in the project sheets. These paths help connect pedestrians with various land uses as well as Fremont residents with neighboring cities.

RECOMMENDATION: Fremont should continue to support neighborhood pathway connector projects because they provide continuous walking corridors for all types of users and for recreational and utilitarian purposes. The city should also support completion of the Bay Trail through Fremont, development of the Union Pacific Rail with Trail, and the Irvington Greenway. These three specific trail projects and other proposed projects are discussed in detail on the following pages.

6.10. PROJECT SHEETS

See the following pages for these specific area improvements. This list represents different project types balanced geographically throughout Fremont. Factors determining these locations included public input, collision locations, and access to commercial land uses and transit.

1. Intersection Improvement: Grimmer Boulevard & Blacow Road
2. Intersection Improvement: Clough Avenue & Fremont Boulevard
3. Intersection Improvement: Mission Boulevard & Driscoll Road
4. Intersection Improvement: Warm Springs Boulevard & Fourier/Lippert Avenues
5. Intersection Improvement: Mission Boulevard & Pine Street
6. Intersection Improvement: Civic Center Drive & BART Way
7. Intersection Improvement: Bonde Way & Fremont Boulevard
8. Intersection Improvement: Paseo Padre Parkway & Sailway Drive
9. Intersection Improvement: Palm Avenue & Mission Boulevard
10. Intersection Improvement: Fremont Boulevard & Washington Boulevard/Bay Street & Union Street
11. Intersection Improvement: Paseo Padre Parkway & Milton Street
12. Intersection Improvement: Fernald Street & Mohave Drive & Crawford Street
13. Intersection/Corridor Improvement: Nursery Avenue & Mission Boulevard
14. Intersection/Corridor Improvement: Mowry Avenue & Peralta Boulevard
15. Intersection/Corridor Improvement: Parkhurst Street/Walnut Avenue & Argonaut Way
16. Intersection/Corridor Improvement: Scott Creek Road between I-680 & Green Valley Road

17. Intersection/Corridor Improvement: Sullivan UNP/Nichols Avenue & Mission Boulevard
18. Corridor Improvement: Auto Mall Parkway & I-680 Interchange
19. Sidewalk Improvement: Cedar Street between Bryant Street & Mission Boulevard
20. Sidewalk Improvement: Mission Boulevard between Mill Creek Road & Mission Creek
21. Sidewalk Improvement: Deep Creek Park
22. Sidewalk Improvement: Los Cerritos Community Park
23. Sidewalk Improvement: Mission Boulevard between Driscoll Road & Mission San Jose High School
24. Sidewalk Improvement: E. Warren Avenue between Navajo Road and Yakima Drive
25. Sidewalk Improvement: Fremont Boulevard between Decoto Road & Tamayo Street
26. Pathway Project: UP Rail Trail
27. Pathway Project: Fremont Boulevard to Dixon Landing Connector
28. Pathway Project: Farwell Drive Path
29. Pathway Project: Hetch Hetchy Trail Extension & Enhancement
30. Pathway Project: Greenbelt Gateway

INTERSECTION IMPROVEMENT: GRIMMER BOULEVARD & BLACOW ROAD

Project Description

This improvement is in Irvington at Grimmer Boulevard and Blacow Road. This intersection is adjacent to Irvington High School and some commercial uses; therefore there are many pedestrians during school hours. The intersection also has high traffic volumes, is signalized, and currently has four crosswalks.

Proposed Improvements

Issues:

- Significant number of school-aged pedestrians and vehicles
- Vehicle infringement into crosswalks next to curbs and pork-chops
- Narrow, un-maintained sidewalk on Grimmer Boulevard

Improvement Options:

- Cut back shrubbery along Grimmer Boulevard and adjacent to the sidewalk
- Truncated domes on curb ramps

Cost Estimate

Total estimated cost is $6,400

INTERSECTION IMPROVEMENT: CLOUGH AVENUE & FREMONT BOULEVARD

Project Description

The Clough Avenue and Fremont Boulevard side-street stop is located in Irvington. This intersection is uncontrolled with a pedestrian crossing on Fremont Boulevard. There is an existing high-visibility crosswalk across Fremont Boulevard with fluorescent yellow pedestrian signage. The crosswalk connects a residential area with commercial land uses.

Proposed Improvements

Issues:

- Uncontrolled crossing with relatively high vehicle speeds
- Long crossing distance across Fremont Boulevard

Improvement Options:

- Extend curb line on Clough Avenue to decrease the pedestrian crossing distance
- Truncated domes on curb ramps

Cost Estimate

Total estimated cost is $97,000

INTERSECTION IMPROVEMENT: MISSION BOULEVARD & DRISCOLL ROAD

Project Description

The Mission Boulevard and Driscoll Road intersection is located north of the Mission San Jose district. This intersection is located near four schools, Mission Hills Christian School, Hopkins Junior High School, Chadbourne Elementary School, and Mission San Jose High School. The intersection also has high traffic volumes and speeds on Mission Boulevard, is signalized, and currently has three crosswalks

Proposed Improvements

Issues:

- One crosswalk on Mission Boulevard
- High volumes of school-aged pedestrians

Improvement Options:

- Crosswalk on the south side of the intersection across Mission Boulevard
- Truncated domes on curb ramps

Cost Estimate

Total estimated cost is $75,000 (Capital Improvement Program project)

INTERSECTION IMPROVEMENT: WARM SPRINGS BOULEVARD & FOURIER/LIPPERT AVENUES

Project Description

The Warm Springs Boulevard and Fourier Avenue intersection is located in the Warm Springs district. This intersection is located near Warm Springs Elementary School and has a history of pedestrian collisions. The intersection is signalized and currently has three crosswalks.

Proposed Improvements

Issues:

- High volumes of school-aged pedestrians
- Large crossing width of Warm Springs Boulevard
- Large turning radii at Lippert Avenue
- Incomplete sidewalks

Improvement Options:

- Extend two of the intersection's corners
- Truncated domes on curb ramps
- Install traverse sidewalk on the north side of the intersection
- Pedestrian signals timed to 2.8 feet/second walking

Cost Estimate

Total estimated cost is $32,100

INTERSECTION IMPROVEMENT: MISSION BOULEVARD & PINE STREET

Project Description

The Mission Boulevard and Pine intersection is located in the Mission San Jose district adjacent to Ohlone College. The intersection is signalized and currently has three crosswalks.

Proposed Improvements

Issues:

- High volumes of pedestrians
- Large crossing width of Mission Boulevard
- Pedestrian destinations are located on the north side of the intersection
- No crosswalk on the north side of the intersection

Improvement Options:

- Install new transverse crosswalk on the northern leg of the intersection
- Truncated domes on curb ramps
- Install audible signals

Cost Estimate

Total estimated cost is $75,000

INTERSECTION IMPROVEMENT: CIVIC CENTER DRIVE & BART WAY

Project Description

The Civic Center Drive and BART Way intersection is located in Fremont's CBD, adjacent to the Fremont BART Station, Washington Hospital and a large shopping center. The intersection has significant pedestrian activity accessing the BART Station and the shopping center. An AC Transit bus stop is also located adjacent to the intersection. The intersection is signalized and currently there are four crosswalks.

Proposed Improvements

Issues:

- Significant pedestrian volumes of all ages
- Large crossing width of Civic Center Drive and large turning radii into BART Way
- Bus Stop has no amenities (see photo)

Improvement Options:

- Decrease the crossing length and turning radii by extending two of the intersection's corners into the intersection
- Bus shelter or bench at the existing bus stop

Cost Estimate

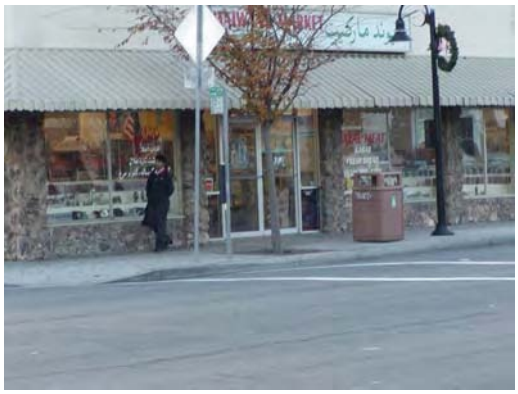
Total estimated cost is $160,000

INTERSECTION IMPROVEMENT: BONDE WAY & FREMONT BOULEVARD

Project Description

The Bonde Way and Fremont Boulevard intersection is the heart of Centerville. This intersection is side-street stop (Bonde Way) with pedestrian crossings across Fremont Boulevard and Bonde Way. There is an existing crosswalk across Fremont Boulevard. The crosswalks at the intersection connect pedestrians with Centerville Station, a weekly Farmers' Market and a bus stop. Traffic volumes are high at this location of Fremont Boulevard.

Proposed Improvements



Issues:

- Significant number of pedestrians and vehicles
- Mid-block crossing with relatively high traffic volumes
- Long crossing distance across Fremont Boulevard

Improvement Options:

- High visibility crosswalks on Bonde Way and Fremont Boulevard
- New bus shelter and relocate southbound bus stop approximately 100 feet in advance of crosswalk to minimize bus blocking pedestrians in the crosswalk
- Truncated domes on curb ramps
- Consider relocating bus stop to Bonde Way frontage at Centerville Station

Cost Estimate

Total estimated cost is $45,200

INTERSECTION IMPROVEMENT: PASEO PADRE PARKWAY & SAILWAY DRIVE

Project Description

The Paseo Padre Parkway and Sailway Drive intersection is located adjacent to the Fremont Senior Center and Central Park. The intersection is between the CBD and the Irvington district. Pedestrians cross this intersection to access amenities in the Park including a skate park and path around Lake Elizabeth. The intersection is signalized and currently has three crosswalks.

Proposed Improvements

Issues:

- Significant school-aged and senior pedestrians
- Large crossing width of Paseo Padre Parkway

Improvement Options:

- Installation of audible signal heads
- Pedestrian signals timed to 2.8 feet/second walking

Cost Estimate

Total estimated cost is $15,000

INTERSECTION IMPROVEMENT: PALM AVENUE & MISSION BOULEVARD

Project Description

The Palm Avenue and Mission Boulevard intersection is north of the Mission San Jose district. This intersection has large volumes of high-speed vehicles traveling on Mission Boulevard and pedestrians crossing to access Mission San Jose High School on the west side of the intersection. The intersection is signalized and currently has three crosswalks.

Proposed Improvements

Issues:

- Significant number of school-aged pedestrians
- Vehicle infringement into crosswalks
- Large turning radii on the southern leg of Palm Avenue

Improvement Options:

- Decrease the crossing length and turning radii by extending three of Palm Avenue's corners into the intersection
- Truncated domes on curb ramps

Cost Estimate

Total estimated cost is $195,000

INTERSECTION IMPROVEMENT: FREMONT BOULEVARD & WASHINGTON BOULEVARD/BAY STREET & UNION STREET

Project Description

The Fremont Boulevard and Washington Boulevard/Bay Street and Union Street intersection is known as the Five Corners intersection and is located in the heart of the Irvington district. This intersection has large volumes of vehicles traveling on Fremont Boulevard. Pedestrians crossing the southern leg of Fremont Boulevard often contend with vehicles continuing south on Fremont Boulevard. High vehicle speeds, the large size of the intersection, and the five legs of the intersection make it a complex place for pedestrians and often leads to difficult situations with vehicles.

Proposed Improvements

Issues:

- Vehicles on southbound Fremont/Washington lane 2 thru lane occasionally turn right onto Fremont Boulevard, conflicting with the pedestrian phase
- Significant number of pedestrians
- Vehicle infringement into crosswalks
- Visibility of pedestrians
- Large intersection size

Improvement Options:

- Add an additional "Right Turn on Green Arrow Only" sign on the northern Fremont Boulevard/Bay Street corner
- Shift the travel lanes on Fremont Boulevard for a curb extension
- Install a longer mast arm pole with a right turn and thru arrow indications for southbound Fremont Boulevard
- Install lane configuration sign for southbound Fremont Boulevard
- Install arrow stenciling in southbound Fremont Boulevard lanes
- Installation of perpendicular curb ramps
- Truncated domes on curb ramps

Cost Estimate

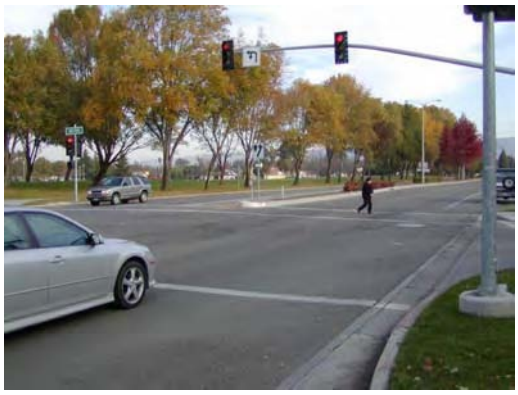
Total estimated cost is $139,000 (does not include street closure).

INTERSECTION IMPROVEMENT: PASEO PADRE PARKWAY & MILTON STREET

Project Description

The Paseo Padre Parkway and Milton Street intersection is located in north Fremont, adjacent to Northgate Park. Relative to other intersection in Fremont, there is a high-rate of pedestrian collisions at this intersection. Pedestrians use this intersection to cross Paseo Padre Parkway and access the path on the south and east sides of the Park. The intersection is signalized and currently has three crosswalks.

Proposed Improvements



Issues:

- Significant number of pedestrians
- Large crossing width of Paseo Padre Parkway and Milton Street

Improvement Options:

- Decrease the crossing length and turning radii by extending two of the intersection's corners

Cost Estimate

Total estimated cost is $120,000

INTERSECTION IMPROVEMENT: FERNALD STREET & MOHAVE DRIVE & CRAWFORD STREET

Project Description

The Fernald Street and Mohave Drive and Crawford Street intersection is in Warm Springs. This intersection is a traffic circle with the three legs yielding to the circle. The area has medium density residential land uses. There are existing sidewalks around the traffic circle but there are no crosswalks.

Proposed Improvements

Issues:

- Significant number of pedestrians
- No crosswalks on any of the legs of the traffic circle
- Sidewalks encircle the traffic circle

Improvement Options:

- Crosswalk on the south side of the intersection across Mission Boulevard
- Truncated domes on curb ramps
- Installation of curb ramps

Cost Estimate

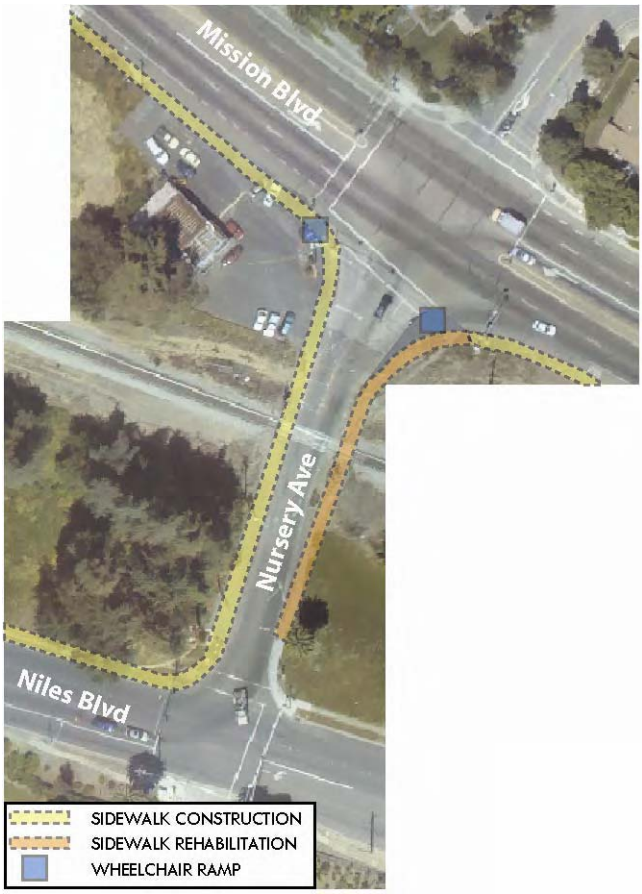
Total estimated cost is $35,000

INTERSECTION/CORRIDOR IMPROVEMENT: NURSERY AVENUE & MISSION BOULEVARD

Project Description

This improvement is in the Niles district on Nursery Avenue and the intersections of Nursery Avenue and Mission Boulevard. Nursery Avenue connects Niles Boulevard and Mission Boulevard and has an at-grade crossing of railroad tracks. This corridor is one of three passages north of Niles to Mission Boulevard. These are signal controlled intersections with three crosswalks each.

Proposed Improvements



Issues:

- Significant number of pedestrians and vehicles
- Vehicle infringement into crosswalks
- Wide Crossing on Nursery Avenue
- Degraded sidewalks
- Un-maintained sidewalks

Improvement Options:

- Curb extensions on two corners of Nursery Avenue
- Completion of sidewalks
- Installation of curb ramps
- Rehabilitation of degraded sidewalk
- Truncated domes on curb ramps
- Truncated domes at pedestrian railroad crossing

Cost Estimate

Total estimated cost is $197,160 (includes sidewalk installation on Nursery Avenue, west of the intersection on Niles Avenue to the connecting sidewalk and Mission Boulevard from Niles Station to Niles Underpass Road).

INTERSECTION/CORRIDOR IMPROVEMENT: MOWRY AVENUE & PERALTA BOULEVARD

Project Description

These improvements are northeast of the CBD. The Mowry Avenue and Peralta Boulevard intersection is large with two free right turns. The primary vehicle movements at this intersection are between Mowry Avenue's north leg and Peralta Boulevard. The triangular spaces between the right-turns and the intersection are pedestrian areas with some green space. The intersection is signalized and has two existing crosswalks.

Proposed Improvements

Issues:

- Long free right-turn pockets
- No marked crossings on right turn pockets

Improvement Options:

- Close one free right-turn
- Reconfigure intersection for maximum green space
- High-visibility crosswalk on southbound right turn
- Advance Stop Bar at high-visibility crosswalk to help prevent vehicle infringement into crosswalks
- Consider an additional crosswalk at signalized portion of intersection
- Truncated domes on curb ramps
- Install curb ramps

Cost Estimate

Total estimated cost is $920,000

INTERSECTION/CORRIDOR IMPROVEMENT: PARKHURST DRIVE/WALNUT AVENUE & ARGONAUT WAY

Project Description

These improvements are southwest of the CBD. The Parkhurst Drive/Walnut Avenue and Argonaut Way intersection is a side-street stop controlled with two crosswalks. The primary vehicle movements at this intersection are along Argonaut Way and Walnut Avenue. These streets currently have four travel lanes and Parkhurst Street has two travel lanes. The December 2004, MTC Pedestrian and Bicycle Safety Technical Assistance Report recommends improving the Argonaut Way/Walnut Avenue corridor and the Parkhurst Drive intersection.

Proposed Improvements

Issues:

- Significant number of pedestrians
- Relative low volumes of vehicles
- Large crossing width of Argonaut Way/Walnut Avenue
- Numerous driveways and side streets
- Sharp horizontal curve at intersection

Improvement Options:

- Install high-visibility crosswalk
- Narrow Parkhurst Drive/Walnut Avenue/Argonaut Way to one lane in both directions
- Install crosswalks at driveways and side streets
- Install a roundabout at the intersection

Cost Estimate

Total estimated cost is $500,000

INTERSECTION IMPROVEMENT: SCOTT CREEK ROAD BETWEEN I-680 & GREEN VALLEY ROAD

Project Description

Scott Creek Road at I-680 is located near the southern boundary of Fremont. The sidewalk improvements are on the Warm Springs district border. The project area currently does not have sidewalks or crosswalks crossing the I-680 freeway ramps.

Proposed Improvements

Issues:

- Lack of sidewalks
- No crosswalks at the freeway ramps

Improvement Options:

- Installation of sidewalks on the north and south side of Scott Creek Road
- Installation of crosswalks at Scott Creek Road interchange with I-680

Cost Estimate

Total estimated cost is $570,000

INTERSECTION/CORRIDOR IMPROVEMENT: SULLIVAN UNP/NICHOLS AVENUE & MISSION BOULEVARD

Project Description

These improvements are in the Niles district on Sullivan Underpass Road (Sullivan UNP) and the intersection of Sullivan UNP and Mission Boulevard. Sullivan Underpass connects Niles Boulevard and Mission Boulevard and crosses underneath the railroad tracks. This corridor is one of three passages north of Niles to Mission Boulevard. The intersection side-street (Sullivan UNP) is stop controlled with no existing crosswalks.

Proposed Improvements

Issues:

- Wide, unmarked crossing for pedestrians across high volume, high-speed arterial road
- Wide crossings on both ends of Sullivan UNP Road
- Large turning radii into Nichols Avenue
- Incomplete sidewalks
- Lack of curb ramps

Improvement Options:

- Curb extension on south side of Sullivan UNP Road
- Curb extensions on the NE, NW, and SW corners on north side of Sullivan UNP Road
- Width reduction of Vallejo Way off of Sullivan UNP Road
- Crosswalks connecting Sullivan UNP to Mission Boulevard
- Completion of sidewalks
- Installation of curb ramps

Cost Estimate

Total estimated cost is $212,100

CORRIDOR IMPROVEMENT: AUTO MALL PARKWAY & I-680 INTERCHANGE

Project Description

The Auto Mall Parkway/I-680 interchange is located between the Mission San Jose and Warm Springs districts. There are currently no sidewalks leading to and over the I-680 over crossing. This prevents pedestrians walking to the commercial land uses located to the west of the interchange from the residential areas on the east side of the interchange. There are two signalized intersections at the two ramps and no crosswalks.

Proposed Improvements

Issues:

- No pedestrian access and circulation across I-680 on Auto Mall Parkway
- Large volumes of vehicles
- Long crossing distance of Auto Mall Parkway

Improvement Options:

- Five-foot sidewalks on both sides of the over pass that connect to existing sidewalks
- Marked crosswalks at two ramp intersections
- Pedestrian refuge island to decrease crossing distance
- Pedestrian signals and push buttons for all major crossings

Cost Estimate

Total estimated cost is $192,100

SIDEWALK IMPROVEMENT: CEDAR STREET BETWEEN BRYANT STREET & MISSION BOULEVARD

Project Description

This improvement project is in Mission San Jose, west of Mission Boulevard. On the northwest corner of the Cedar Street/Bryant Street intersection is the Mission San Jose Elementary School. The intersection in the middle of the project location, Cedar Street/Ellsworth Street is an all-way stop. The sidewalk installation project is important for students accessing the school from the residential neighborhood as well as neighbors accessing the retail uses on Mission Boulevard.

Proposed Improvements

Issues:

- Lack of Sidewalk
- Close proximity to elementary school
- Close proximity to retail land uses
- Numerous driveways

Improvement Options:

- Install sidewalks along both sides of Cedar Street between Bryant Street and Ellsworth Street and on the south side of the street between Ellsworth Street and Mission Boulevard.

Cost Estimate

Total estimated cost is $200,000 (Capital Improvement Program project)

SIDEWALK IMPROVEMENT: MISSION BOULEVARD BETWEEN MILL CREEK ROAD & MISSION CREEK

Project Description

This improvement project is in Mission San Jose, on Mission Boulevard. On the north end of the project boundary is the Mill Creek Road/Starr Street and Mission Boulevard side-street stop intersection. To the south is Mission Creek. Existing on the west side of Mission Boulevard is a pleasant walking environment with a street tree buffer. .

Proposed Improvements

Issues:

- Lack of sidewalk on the east side of Mission Boulevard
- Relatively high vehicle volumes
- Relatively high vehicle speeds
- Close proximity to natural areas
- Bus Stop on Mission Boulevard at Mill Creek Road

Improvement Options:

- Install a sidewalk on the east side of Mission Boulevard between Mill Creek Road and Mission Creek

Cost Estimate

Total estimated cost is $545,500 (Capital Improvement Program project)

SIDEWALK IMPROVEMENT: DEEP CREEK PARK

Project Description

This improvement project is in Ardenwood along Emilia Lane. At this location there is a park (Deep Creek Park) as well as the Ardenwood Elementary School. Currently, no connecting sidewalk between these two land uses exists. A sidewalk along the Park boundary would provide a convenient access route to and from the school.

Proposed Improvements

Issues:

- Lack of sidewalk on the north side of Deep Creek Park
- An elementary school neighbors the Park
- High volumes of school-aged pedestrians

Improvement Options:

- Install a sidewalk on the south and west side of Emilia Lane adjacent to Deep Creek Park and Ardenwood Elementary School

Cost Estimate

Total estimated cost is $275,000

SIDEWALK IMPROVEMENT: LOS CERRITOS COMMUNITY PARK

Project Description

This improvement project is located just west of Centerville near the intersection of Nicolet Avenue and Alder Avenue. The Project is located in Los Cerritos Community Park, which is immediately adjacent to Fremont Unified School District's American High School.

Proposed Improvements

Issues:

- Lack of sidewalk on the southeast side of Los Cerritos Community Park
- High student-aged pedestrian volumes

Improvement Options:

- Improve the sidewalks along Nicolet and Alder Avenues

Cost Estimate

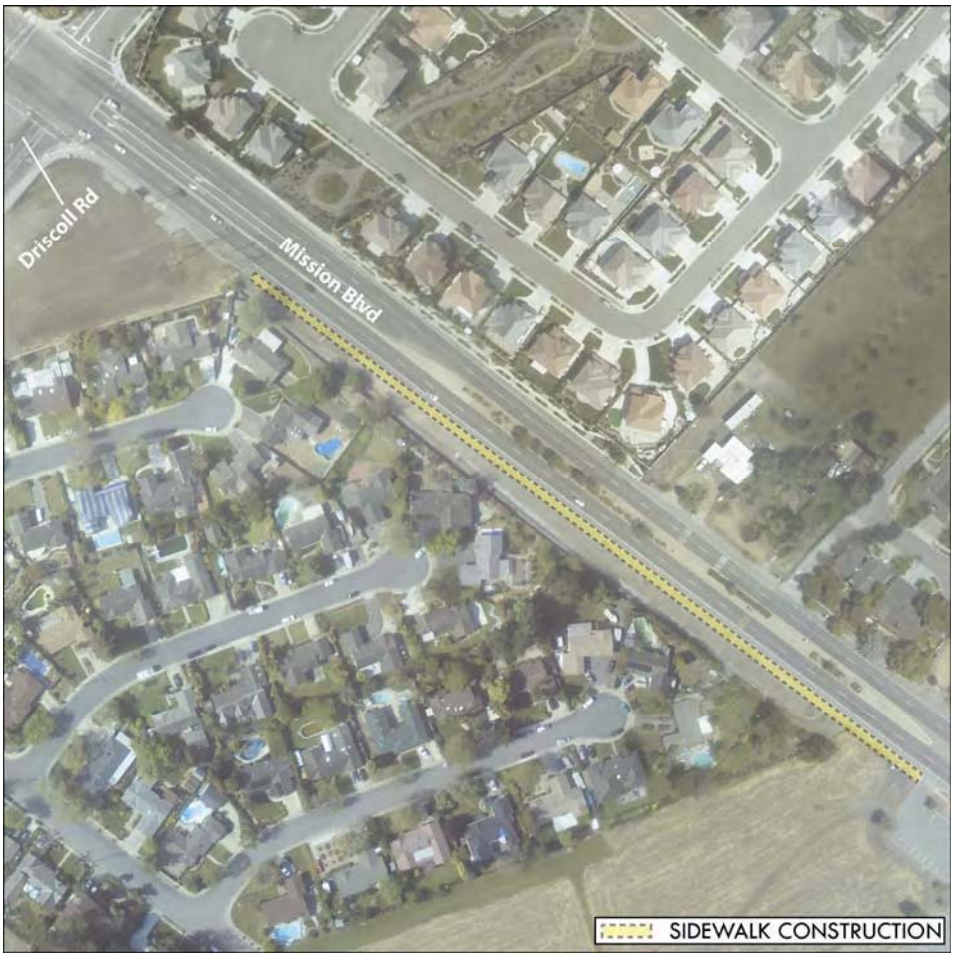
Total estimated cost is $217,000

SIDEWALK IMPROVEMENT: MISSION BOULEVARD BETWEEN DRISCOLL ROAD & MISSION SAN JOSE HIGH SCHOOL

Project Description

This improvement project is north of Mission San Jose and I-680. In the immediate area are three schools, including Mission San Jose High School, Hopkins Junior High School, and Mission Hills Christian School. Also, adjacent to the site is a park-and-ride lot for the transit stop on Mission Boulevard. The north end of the project boundary is the Driscoll Road/Castro Lane and Mission Boulevard intersection. The south end of the project boundary is the Mission San Jose park-and-ride lot driveway located on the south side of Mission Boulevard.

Proposed Improvements



Issues:

- Lack of sidewalk on the west side of Mission Boulevard
- Significant number of school-aged pedestrians
- Relatively high vehicle volumes
- Relatively high vehicle speeds
- Close proximity to transit

Improvement Options:

- Install a sidewalk on the west side of Mission Boulevard beginning approximately 250 feet south of Driscoll Rod to the Mission San Jose High School park-and-ride lot

Cost Estimate

Total estimated cost is $200,000 (Capital Improvement Program project)

SIDEWALK IMPROVEMENT: E. WARREN AVENUE BETWEEN NAVAJO ROAD & YAKIMA DRIVE

Project Description

This improvement project is in the Warm Springs district where E. Warren Avenue underpasses I-680. There are currently no sidewalks on the north side of E. Warren Avenue, connecting the residential land uses on either side of the Freeway.

Proposed Improvements

Issues:

- Lack of sidewalk on the north side of E. Warren Avenue
- Freeway acts as a pedestrian barrier
- Many residential land uses in the area

Improvement Options:

- Install a sidewalk on the north side of E. Warren Avenue

Cost Estimate

Total estimated cost is $378,000

SIDEWALK IMPROVEMENT: FREMONT BOULEVARD BETWEEN DECOTO ROAD & TAMAYO STREET

Project Description

This improvement project is located just south of the Aredenwood district on Fremont Boulevard between Decoto Road and Tamayo Street. This stretch of Fremont has incomplete sidewalks and potentially, high volumes of pedestrians.

Proposed Improvements

Issues:

- Incomplete sidewalk network
- High vehicle volumes

Improvement Options:

- Improve sidewalks so there is a continuous network on both sides of the street along Fremont Boulevard

Cost Estimate

Total estimated cost is $430,000

PATHWAY PROJECT: UP RAIL TRAIL

Project Description

The proposed Union Pacific Rail Trail would follow current and future abandoned Union Pacific Railroad (UPRR) corridors between the Milpitas/Fremont border in the south and Clark Drive (Niles area) to the north, a total of 9 miles. Some segments of the UPRR corridor has been abandoned. A feasibility study is currently in progress to examine the potential of this rail trail project, and the compatibility of the project with the BART extension to Warm Springs and Santa Clara County. The City has negotiated with Union Pacific for a right-of-way exchange as part of an ongoing grade separation project in the vicinity of Washington Boulevard and Paseo Padre Parkway. The right of way exchange provides the City with a 1.3 mile segment adjacent to Central Park to construct a bicycle/pedestrian trail and maintenance road (initial segment of the larger proposed trail project). The City of Fremont should pursue the installation of a Class I facility along the Union Pacific Railroad right-of-way from the Milpitas/Fremont border to Clark Drive. A feasibility study is ongoing and will be completed in 2007.

Project Segments

1) From Niles (Clarke Drive/Old Canyon Road) to Mission Boulevard.

Clarke Drive is the proposed northern boundary of the rail trail project. The entrance to the proposed rail trail is one block from the Alameda Creek staging area off of Old Canyon Road. The feasibility study will evaluate the cost of acquiring right-of-way in the abandoned UPRR rail corridor and would evaluate access to the trail as well as the cost to construct the Trail

2) From Mission Boulevard to Paseo Padre Parkway.

A portion of the Mission Boulevard to Paseo Padre Parkway trail section includes the city acquisition of 7,300 feet of the UPRR line for the Grade Separation project. The City has negotiated a right-of-way exchange with Union Pacific for the property.

3) From Paseo Padre Parkway to Washington Boulevard.

This segment of the trail will run along the abandoned UPRR line and will be acquired as part of the grade separation project. The feasibility study will evaluate access to Washington Boulevard and Paseo Padre Parkway.

4) From Washington Boulevard to S. Grimmer Boulevard.

Trail alignment, access and right-of-way needs are being evaluated for this segment.

5) From South Grimmer Boulevard to South City Limits.

Trail alignment, access and right-of-way needs are being evaluated for this segment.

Cost Estimate

Estimated construction costs for Segments 1, 2, and 3 are the following: Segment 1 is estimated at $1,135,000, Segment 2 at $1,200,000 and Segment 3 at $700,000. Cost does not include purchase of UPRR right-of-way.

PATHWAY PROJECT: FREMONT BOULEVARD TO DIXON LANDING CONNECTOR

Project Description

The southern segment of Fremont Boulevard currently terminates just south of Lakeview Boulevard on the west side of I-880. At this time, there is no connection to Dixon Landing Boulevard in Milpitas. An existing Bay Trail segment extends to the west of Fremont Boulevard, also terminating near Lakeview. See the San Francisco Bay Trail website for additional information (http://baytrail.abag.ca.gov/).

Alignment Options

Two options are possible for making this pedestrian connection between Fremont Boulevard and Dixon Landing Road.

The first is a Class I trail (west of the roadway) that would be developed when the extension of Fremont Boulevard occurs. This extension is currently identified as a Bay Trail alignment and is expected to occur as part of the parcel development frontage to the future Fremont Boulevard alignment.

The second option is a Class I off-street path that would not be dependent on future development. This Class I path could be developed as a segment of the San Francisco Bay Trail. The proposed Bay Trail alignment would run west of Fremont Boulevard, generally following Coyote Creek, connecting to Dixon Landing Road. The Bay Trail route would require a crossing of Coyote Creek, an Alameda Flood Control Channel, and a feasibility study to evaluate the exact alignment of the path, environmental study, constructability, construction project cost and maintenance cost to the City. The City of Fremont should work with the Association of Bay Area Governments to explore the feasibility of a Class I Bay Trail segment connecting Fremont with Milpitas west of Fremont Boulevard independent of the Fremont Boulevard extension into Milpitas.

Alignment Locations

abag.ca.gov

Photo looking south from Fremont Boulevard

abag.ca.gov

The trail would cross this channel and continue south

Cost Estimate

Total estimated cost for Option 1 is $341,000 and $535,000 for Option 2

PATHWAY PROJECT: FARWELL DRIVE PATH

Project Description

The proposed Farwell Drive to Lemke Place path would reconstruct the trail running through the greenbelt area parallel to Farwell Drive and behind Kennedy High School. The path would provide a link though the existing residential neighborhood and would serve as a recreational asset for all Fremont residents.

Project Status

Farwell Drive to Lemke Place Pedestrian and Bicycle Path Improvements Project was included as a project in the 2002 Fremont Bicycle and Pedestrian Master Plan and is in the 2005 Bicycle Master Plan. The purpose of the project is to reconstruct the pedestrian and bicycle trail in the greenbelt area between a residential development and Kennedy High School. The project was originally scheduled to begin in the 2004-2005 fiscal year but was defunded due to city cutbacks.

Cost Estimate

Total estimated cost is $265,000

PATHWAY PROJECT: HETCH HETCHY TRAIL EXTENSION & ENHANCEMENT

Project Description

The existing Plomosa Trail follows the right-of-way of the subterranean Hetch Hetchy Aqueduct through southern Fremont from the Fremont/Milpitas City Limit to Crawford Street. The existing trail is comprised of pedestrian pathways of varied width along a linear corridor of open landscaped areas and developed park facilities. Extending and enhancing this trail would provide residents of southern Fremont with an additional north-south route. An enhanced Hetch Hetchy Trail would provide a Class I path linking the numerous parks located along the right-of-way. As part of the trail extension and enhancement, attention should be paid to the mid-block crossings along the Plomosa Trail that would require crossing enhancements for the path project.

Project Status

The Hetch Hetchy Trail Extension is in the 2005 Bicycle Master Plan.

Cost Estimate

Total estimated cost is $1,320,000

PATHWAY PROJECT: GREENBELT GATEWAY

Project Description

The Greenbelt Gateway is a proposed path/sidewalk along the PG&E/Alameda County Flood Control Channel right of way. The pathway would connect the Fremont Boulevard and Grimmer Boulevard intersection to Central Park at Paseo Padre Parkway and Grimmer Boulevard. The project would consider full street improvements (sidewalk, curb and gutter) on Grimmer Boulevard between Fremont Boulevard and Paseo Padre Parkway as well as pedestrian improvements to the intersection of Paseo Padre Parkway and Grimmer Boulevard.

Proposed Improvement

Cost Estimate

Total estimated cost is $775,000

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7. POLICY RECOMMENDATIONS

7.1. INTRODUCTION

The City of Fremont clearly recognizes the benefits of being a community that facilitates circulation and access for pedestrians. The 2005 Bicycle Master Plan is a demonstration of this commitment as is the detailed planning effort for this Pedestrian Master Plan.

In many parts of Fremont walking is not considered an easy option for getting around. A large part of the disconnect between the City's intentions and the reality on the ground is a matter of time: it takes years for a community to transform its policy framework in order to revise its transportation priorities. It takes even longer—sometimes decades, to reverse past infrastructure policies so that its transportation network may be retrofitted.

While Fremont's development policies focus more on pedestrian circulation than they did in the past, there are more policy changes that can continue to help improve the pedestrian network. This Chapter summarizes these policy recommendations. Overarching policy recommendations to improve the pedestrian environment in the City of Fremont are:

1. Develop policies in the General Plan that meet and promote pedestrian goals outlined in the Pedestrian Master Plan.
2. Establish departmental practices within the City of Fremont to ensure implementation of pedestrian projects.
3. Work with groups and departments outside of the City of Fremont to promote the pedestrian network

Below is a summary of these policy recommendations.

7.2. LOCAL POLICIES

Typically, a city's own policies and the practices of its departments are the most important influences for attaining pedestrian-oriented goals and this is also the case for the City of Fremont. Some examples of policies are land use-related and include zoning provisions that segregate land uses, dictate low development densities, require generous parking and favor regional "big box" retail. Other policies relate to transportation circulation.

7.2.1. General Plan Update

7.2.1.1. Land Use Policies

The City of Fremont General Plan, including the Land Use and Transportation elements, is scheduled for update in 2007-09. The City should use this opportunity to develop citywide land use policies that promote pedestrian circulation by emphasizing compact, mixed-use, transit-oriented and infill development. The City has already adopted a number of such policies under the concept plans it has prepared for the CBD and for the districts of Centerville, Irvington, Mission San Jose, Niles and Warm Springs.

Following adoption of the updated General Plan, the City's planning and zoning code should be revised to include provisions that support the new General Plan policies. Pedestrian-friendly zoning provisions include requiring shorter street blocks; pedestrian-oriented streetscape elements, building façades and street fronts in new development; structured parking instead of surface lots and parking in the rear of commercial establishments rather than in front; and reduced parking requirements, especially at transit-oriented development projects. Zoning near boundary walls and at cul-de-sacs should be addressed in zoning provisions too, providing pedestrian connections to arterials, commercial centers, and adjacent neighborhoods at every reasonable opportunity.

RECOMMENDATION: Fremont should develop pedestrian-friendly land use policies in the General Plan update as well as update zoning provisions to include pedestrian improvements to new developments, allowing passage through walled developments and providing continuous accessible pedestrian pathway connections from public right of ways (sidewalks) to building entrances or facility entrances.

7.2.1.2. Transportation Policies

Similar to the prior recommendation, the City should use the update to the Transportation Element of the General Plan as a means for developing citywide transportation policies that promote walking. For example, a policy should state that the Pedestrian Plan should be a guide for prioritizing pedestrian improvements in Fremont. Policies like this would reinforce and, in turn, be strengthened by, the land use policies outlined in the previous section.

Transportation policies at the General Plan level should be supported by complementary changes in the planning and zoning, traffic and public works codes. Specifically, the City should adopt local roadway-design and traffic-control standards that restore the balance between pedestrians and motorists. Such standards could call for narrower streets and lanes, smaller intersections, tighter corner radii, curb bulb-outs, limits on free right-turning lanes and longer pedestrian-crossing signal times. The development of local traffic standards should involve all relevant departmental divisions in order to take into account all transportation modes and address potential conflicts between different priorities and interests.

RECOMMENDATION: Fremont should develop policies that promote walking in the General Plan update.

7.3. INTERNAL POLICIES

7.3.1. Institutional Policies

The City of Fremont already employs a cadre of professionals within its Planning and Transportation and Operations Department who can bring the skills and perspective of a pedestrian planner to their work. At the same time, Fremont has caring and capable planning commissioners, council members and other residents who, with enough exposure to the issues, can become effective pedestrian advocates. With this goal in mind, Caltrans and the California Department of Health Services jointly fund a program to educate local-agency staff and others on the fundamentals of creating walkable communities. Through this program, local jurisdictions can hire trained "walkability experts" to help staff, elected officials and community organizers identify ways to make their communities more pedestrian friendly.

RECOMMENDATION: Fremont should continue to implement pedestrian planning into its everyday effort, work to educate staff and elected officials about the fundamentals of pedestrian planning.

7.3.2. Collaboration among City Departments

Concerning pedestrian issues, lack of collaboration among departments can result in missed opportunities to match priority pedestrian projects with available funding sources and to incorporate pedestrian improvements as part of larger development projects. Currently, within the City of Fremont, the City Technical Coordinating Committee (CTCC) meets every week to discuss all new planning projects under review.

RECOMMENDATION: When reviewing new planning projects, the CTCC should consider projects outlined in the Pedestrian Master Plan.

7.4. EXTERNAL POLICIES

7.4.1. Inter-Agency Coordination

Not all decisions directly related to transportation and land use projects within the City of Fremont are under the City's jurisdiction. The City should work cooperatively with property owners or land controlled by other agencies, such as BART, East Bay Regional Park District (EBRPD) and Alameda County Flood Control and Water Conservation District (ACFCWCD). In these areas, the policies and standards of other agencies apply.

Of greatest relevance to the Pedestrian Master Plan is that Caltrans has decision-making authority over the segments of state freeways and highways that cross Fremont. These include Interstate 880 and Interstate 680 but also State Route 238 (Mission Boulevard) and State Route 84 (Decoto Road south of I-880 and the approach to the Dumbarton Bridge). Two policies adopted by Caltrans in 2001 have potential to transform Caltrans' views and treatments for pedestrian circulation.

1. Deputy Directive 64, also known as the "routine accommodation" policy; requires Caltrans to ensure that the transportation system recognizes the needs of pedestrians and bicyclists and that capital projects incorporate best practices for non-motorized users.

2. "Context sensitive solutions," requires Caltrans to work through a "collaborative, interdisciplinary" process "involving all stakeholders" for projects on its highways, particularly those that function as local streets.

RECOMMENDATION: The City should recognize other agencies' liability concerns when proposing pedestrian projects and work cooperatively with other agencies to address their concerns. If necessary for overcoming resistance from a county, regional, state or federal agency, the City should consider appealing to state and federal lawmakers.

7.4.2. Promote the Benefits of Walking

Few people dispute the significant public-health, transportation, community-building and other benefits of walking. Many people, however, might not be aware of the full range of benefits or might not have "internalized" this information to the point of having become pedestrian advocates. Educating residents, merchants and, perhaps most importantly, decision-makers about the benefits of walking is not enough to overcome deep opposition but is often sufficient to generate the support needed for many pedestrian improvements, especially over the long term.

RECOMMENDATION: Fremont should implement programs to encourage people to walk, as outlined in Chapter 8.

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8. ENCOURAGING PEOPLE TO WALK

Public awareness and education programs are important complements to the proposed pedestrian improvements of this Plan. In addition to programs promoting walking, it is necessary to make certain that there is an education component that covers pedestrian and motorist laws. For example, many people do not understand that motorists must yield to pedestrians crossing at intersections, regardless of whether there is a marked crosswalk in place or not . Others may be confused as to when crossing a street mid-block constitutes jaywalking. Of course, all of these elements are most effective when accompanied by a robust campaign of enforcement of the existing laws that protect pedestrians.

8.1. PEDESTRIAN AWARENESS CAMPAIGN

A public awareness campaign of walking as a means of transportation emphasizes crossing safety and contributes to helping people make healthier lifestyle choices. The City of Fremont includes a wide spectrum of people who can benefit from walking, including an active senior community, immigrant populations, visitors, tourists, students, employees and, employers. Encouraging people to walk can provide the invitation necessary to start a lifestyle change.

A public awareness campaign, through literature and public service announcements, can make walking seem like a more enticing transportation option. There are a variety of different ways to undertake these campaigns. One way is through partnership, for example the City of Fremont could partner with its neighbor to the south, San Jose, in its "Street Smarts" program. The program could become a regional program that helps teach traffic safety. For more information visit the Street Smarts webpage at: www. getstreetsmarts.org. Other public awareness campaigns are described below.

8.1.1. Print Campaign

Program

The print campaign could include guides with map inserts, bumper stickers, and posters.

A. The brochures could include the following information:
   - Maps highlighting routes and sites
   - Health benefits of walking
   - Rules of the road and sidewalk
   - Information/hotline number

B. Bumper stickers could feature a promotional slogan, such as "Fremont Walks!"

Distribution

A. The brochures, maps, and bumper stickers could be distributed in and around Fremont to businesses and community groups.

B. Brochures could be provided to the Fremont Police Department to distribute to those who receive moving violations.

C. Brochures and posters could be distributed at the following locations:

- Worksites
- Retail sites
- Chamber of Commerce
- Visitors Bureau
- Hotels and motels
- Gas stations
- Libraries
- Community centers
- DMV
- Churches
- Schools

D. Access to the material could be promoted on the City's web site.

City of Fremont staff or a consultant can produce and arrange the distribution of printed materials and identify sponsors and funding sources to offset the costs associated with the printed material. All activities can be done under the supervision of the Transportation & Operations Department (T & O Dept.).

8.1.2. Public Service Announcements

A cost-effective way for the City of Fremont to promote the pedestrian mode as an effective and enjoyable way to travel is to use existing television public service announcements made available through the National Highway Traffic Safety Administration (NHTSA), Safe Kids Coalition, and the California Office of Traffic Safety (OTS). These agencies provide existing award-winning television public service announcements on the following topics:

- Pedestrian education for seniors
- Pedestrian education for the general public
- Pedestrian education for children and their families
- Driver education on pedestrians
- Drivers running red lights

The City of Fremont can tag each of the television public service announcements with the following message "Fremont Walks!". Call XXX-XXXX for more information!" Production of the tags could be accomplished by the city's cable station.

A. Movie Theatre Promotion

The City of Fremont could provide local movie theatres with existing television public service announcements to be included as trailers on-screen. Several theatres use slides for community announcements, and the City of Fremont could provide a slide or digital photo of the slogan "Fremont Walks! Call XXX-XXXX for more information."

B. Fremont Spokesperson

Solicit the interest of local television and radio public service directors to interview a Fremont spokesperson to discuss the campaign and the importance of walking as an alternative mode of transportation in Fremont.

A consultant can produce and arrange for the distribution of public service announcements. In addition, a consultant can identify sponsors and funding sources to offset the costs associated

with the printing of materials. All activities can be done under the supervision of the T & O Department.

8.1.3. Other Promotional Activities

Theme of Focus: The promotional theme of "Fremont Walks!"

A campaign of promotions could be implemented to promote walking as an effective, fun and economical way to travel in Fremont.

A. Commuter of the Month

Implement a contest for residents and employers to nominate a person who walks and/or uses transit to get around Fremont. Entry forms available at employer sites, retail sites, churches, and recreation and community centers could promote the contest. Monthly winners could receive prizes that may include gift certificates to dinner, retail stores, and merchandise.

B. Murals

Murals have successfully been used to promote ideals and inform the community of important issues. The mural program could solicit help from local volunteers, artists, children, seniors, and other community members. Costs for the production of the murals could be generated by grants through public art foundations.

C. Retail Involvement

Partnerships with local retailers could be established to promote walking. These partnerships could involve the campaign theme being promoted on bag stuffers and pre-printed bags. The costs of the bag stuffers and pre-printed bags could be born by retailers and could act as a donation by them. The City of Fremont could provide suggested artwork for the printed material. Retailers could, if possible, agree to provide counter space for guides and window space for promotional posters.

D. Walk Exhibit

Fremont could produce a traveling mobile exhibit promoting walking and bicycling. The exhibit could feature the following elements:

- Photo displays of new facilities
- Photos of residents and employees walking
- Walk Guides
- Interactive video encouraging participants to take the "Fremont Walks! Challenge"

This exhibit could be featured at all community events including Earth Day, Clean Air Week, Bike to Work Week, and other events. The exhibit could be built to allow assembly and attendance to be done by one person.

E. Event Producers Obligation

Fremont could require all community events to promote walking (and bicycling) in all event literature, advertisements, and other collateral materials as a mode of transportation to their event. The City could include this requirement as part of the permit process for events.

F. Community Event

Fremont could produce an annual "Fremont Walks!" expo to promote the use of alternative modes of transportation, including shuttle services, buses, electric cars, bicycling, and carpooling. Other aspects of walking could also be showcased, including health benefits, the active lifestyle of those who walk, the equipment, the financial benefits, and the environmental benefits.

The event could include:

- Exhibits from law enforcement
- Exhibits from vendors
- Exhibits from transit providers
- Exhibits from alternative modes of transportation providers
- Exhibits on pedestrian facilities
- Entertainment
- Sidewalk Stroll, a recreational walk for all ages

G. Monthly Events

Sidewalk Strolls - Organized walks could be implemented for seniors at local centers. The goal of these events could be to generate interest in recreational walking for health reasons with the ultimate goal of promoting walking as a form of transportation.

City Walk Tours - Organized walks could be organized for the general public in order to (1) showcase the destinations reachable by walking, (2) educate participants on walking as a mode of transportation and (3) promote walking as a healthy activity.

The production, coordination, and implementation of all promotional activities can be done by either City of Fremont staff or consultants. In addition, costs associated with the promotional activities can be offset by sponsors and other funding sources. All activities can be performed under the supervision of the Transportation and Operations Department.

8.2. PEDESTRIAN EDUCATION PROGRAMS

Education can make pedestrians and motorists more aware of potentially hazardous environments and teach them the skills needed to make walking a more effective and enjoyable way to travel. There are a number of broad-based educational subjects that address particular issues, with individual programs that can be tailored around a specific theme or themes.

8.2.1. Safety Education Campaign

A variety of safety education campaigns could be undertaken by the city in order to educate motorists on the rights of pedestrians, and to educate pedestrians on safe behavior. The campaign could include messages related to speeding, yielding to pedestrians in crosswalks, stopping at stop signs, red light running, or jaywalking.

Sample messages might include:

- "Save A Life – Your Own. Don't Jaywalk.
- "STOP! It could be someone you love in the crosswalk."
- •"Use the other pedal and slow down."

- "Slow Down! It could be someone you love."
- "Want to meet cops? Don't stop for pedestrians in the crosswalk."

Elements of a successful pedestrian education program would include:

Media Coverage and Events, including statements of support from City officials, support of the Fremont Police Department, and development of a press kit outlining the program to get media coverage.

Print Campaign, incorporating the promotional themes in maps, posters, bumper stickers, guides, and television public service announcements.

Street Banners, that display a safety message such as "SLOW DOWN" and "Everybody Walks in Fremont!" Rotating the banner to different neighborhoods on a regular basis can keep the message fresh and reach new audiences.

The city could develop its own original campaign materials, or purchase an existing campaign "kit" such as the Street Smarts campaign developed by the City of San Jose. The Street Smarts has been adopted by a number of jurisdictions around the Bay Area, and is a modular program that can be customized by each city and is set up to utilize a broad mix of media including billboards, print ads, bus shelters, bumper stickers, and neighborhood lawn signs.

8.2.2. Driver Education

Theme of Focus: Laws for pedestrians and motorists

Programs

A. Walk Guides

The program could be created to educate drivers on the laws for pedestrians and motorists as well as encourage drivers to share the road.

B. Speakers

A consultant could visit traffic schools to talk about the rights, the responsibilities, and the proper behavior of pedestrians in relation to traffic. If a consultant cannot be arranged to participate in existing traffic school programs, then the Fremont Police Department could speak with participants at community events.

City of Fremont staff or a consultant can conduct presentations at traffic schools and identify sponsors and funding sources to offset the costs associated with the presentations. All activities can be performed under the supervision of the Transportation and Operations Department.

C. Share the Road

The Share the Road message could be included all printed material to be distributed at worksites, parking structures, and retail sites.

8.2.3. Enforcement Education

Themes of Focus

- Improve communication with law enforcement
- Prioritize enforcement of pedestrian and motorist laws

Program

The program could work to improve communication between the public and the Fremont Police Department, as well as work to prioritize enforcement of pedestrian safety laws. A consultant could meet with Fremont Police Department officers, especially bicycle patrol officers, to open up discussion about existing problems facing pedestrians and motorists. The officers could also be briefed on new facilities that affect walking in the City of Fremont. In addition, City staff could provide all information regarding available programs to be implemented to encourage pedestrian activity.

A consultant could also meet with Fremont Police Department and other municipal departments to discuss public safety.

8.2.4. Senior Citizen and Disabled Pedestrian Education

Themes of Focus:

A pedestrian walking near the Fremont BART Station

- Suggested Places to Walk
- Poor choices to walk
- Personal Safety
- Traffic devices
- Recognition of causes of pedestrian collisions
- Avoidance of pedestrian collisions
- Promotion of proper attire (bright colors, proper shoes, glasses, walkers, canes etc)
- Effects of certain medication on physical reactions, eyesight, hearing

Program

These programs could include instructors and guest speakers to provide information specific to the needs of the seniors and disabled.

A. Instructor

Presentations would be conducted by an instructor, either City of Fremont staff or a consultant at community centers, churches, clubs, senior citizen centers, physician offices, and hospitals. The presentation could address the sensitive issues of physical limitations of many seniors and the crucial need for them to reach their destinations (e.g. medical appointments, food shopping, etc.).

City of Fremont staff or a consultant can conduct the presentations and identify sponsors and funding sources to offset the costs associated with the presentations. All activities can be performed under the supervision of the Transportation and Operations Department.

B. Guest Speakers

In addition, presentations can include guest speakers including officials from Fremont, transit providers, retailers, physicians, and officers from the Police Department. A consultant can coordinate the participation of guest speakers and identify sponsors and funding sources to offset the costs associated with the presentations. All activities can be performed under the supervision of the Transportation and Operations Department.

8.2.5. Teen & Adult Pedestrian Education Program

The program could produce a video and encourage teens and adults to walk for commuting, improved health, and fun.

A. Interactive Video

A consultant, in conjunction with a vendor, could produce an interactive video to simulate the City's traffic environment and test the user's abilities as a pedestrian to ride and walk through Fremont from destination to destination. The user could receive a score for knowledge and skills as a pedestrian. The video could showcase the existing pedestrian facilities and be presented in multiple languages.

The video could be made available to employers, recreational centers, libraries, community groups and Neighborhood Watch organizations. In addition, the video could be made accessible to general public via the city's website. Existing technology could allow the production of this interactive video to be cost effective and a valuable source of on-going education.

A consultant can coordinate the production of the interactive video and identify sponsors and funding sources to offset the costs associated with the presentations. All activities can be performed under the supervision of the Transportation and Operations Department.

8.2.6. Education for Elementary School Children

Theme of Focus: Pedestrian Education

Programs

The programs for elementary schoolchildren include rodeos and classroom curricula and could be tailored to meet the needs of schoolchildren, parents, and teachers in pre-school through 6th grade.

A. Community-Based Rodeos

Community-based rodeos could be conducted bi-monthly for families of school-aged children and could include bicycle and pedestrian education. Volunteers—including parents, senior citizens, bike enthusiasts, and other screened/qualified volunteers—could staff the rodeo.

Each rodeo could feature a traffic simulation course consisting of a miniature city with streets, sidewalks, intersections, traffic signs, traffic signals, a residential area, a business area, bike lanes, trucks, and buses. The course could allow children with their parents to practice bicycle handling and pedestrian skills. By utilizing this simulated environment, the ability of children to recognize traffic hazards is improved. These rodeos could also allow parents to participate in the educational process by involving them in the lesson plans.

B. Curriculum

Curricula could be implemented in pre-schools, childcare centers, and elementary schools in Fremont. The curricula could be designed to target specific grade levels: pre-school, kindergarten, 1st, 2nd, 3rd, 4th, 5th, and 6th grades. Each grade level program could include basic information, demonstrations, activities, and printed material. One such program in place is the Safe Moves/Smart Moves program for Kindergarten through 6th grades, administered by the non-profit group Smart Moves. Topic areas include:

- Recognition and avoidance of common pedestrian collisions
- Understanding of motorists, rights, and responsibilities
- Awareness of the California Vehicle Code governing pedestrians
- Physical, social, and economic consequences
- Promotion of benefits of walking as an effective mode of transportation
- Traffic knowledge assessment and skills
- Pedestrian Education at Bus Stops
- Proper behavior around bus stops
- Schedules, fares, and passenger skills

8.2.7. Operation Lifesaver – Rail Safety Education

Rail education is important for Fremont due to the proximity of schools to at-grade rail crossings. Operation Lifesaver is a non-profit organization that provides public education to end collisions, deaths, and injuries from locations where roads cross railroads. The organization was established in 1972 and is sponsored by governments and the railroad industry. Its education resources are available online at: http://www.oli.org/ .

The City of Fremont could work with the Fremont Unified School District on implementing these education programs. Operation Lifesaver provides lesson plans for all grades. The Organization also has speakers and videos available as well as certificates for participating students. A City staff member could become an Operation Lifesaver presenter and visit schools near Fremont's train crossings, helping to educate younger walkers about train traffic.

8.2.8. Enforcement of Pedestrian Laws

Targeted pedestrian enforcement action should be focused in those areas with high pedestrian volumes or where pedestrians are especially vulnerable. Law enforcement efforts should be targeted during periods and at locations where motorists and the general public can become aware of pedestrian laws and their penalties. It is recommended that such targeted enforcement occur at least four times per year and last one week. Focused enforcement should also take place at the start of the school year at selected schools near their primary access points by children walking. The Police should also be surveyed for input on appropriate educational material, advisory and warning signs, and other tools to help them accomplish their mission. Finally, it is recommended that the Police Department vigorously pursue legal action against motorists who cause a pedestrian injury or fatality.

Pedestrians are protected in the public right-of-way by the California Vehicle Code, as enforced by the Fremont Police Department. Some of the key provisions of the California Vehicle Code as it relates to pedestrians are shown below.

21950. (a) The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection, except as otherwise provided in this chapter.

(b) This section does not relieve a pedestrian from the duty of using due care for his or her safety. No pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle that is so close as to constitute an immediate hazard. No pedestrian may unnecessarily stop or delay traffic while in a marked or unmarked crosswalk.

(c) The driver of a vehicle approaching a pedestrian within any marked or unmarked crosswalk shall exercise all due care and shall reduce the speed of the vehicle or take any other action relating to the operation of the vehicle as necessary to safeguard the safety of the pedestrian.

(d) Subdivision (b) does not relieve a driver of a vehicle from the duty of exercising due care for the safety of any pedestrian within any marked crosswalk or within any unmarked crosswalk at an intersection.

21950.5. (a) An existing marked crosswalk may not be removed unless notice and opportunity to be heard is provided to the public not less than 30 days prior to the scheduled date of removal. In addition to any other public notice requirements, the notice of proposed removal shall be posted at the crosswalk identified for removal.

(b) The notice required by subdivision (a) shall include, but is not limited to, notification to the public of both of the following:

(1) That the public may provide input relating to the scheduled removal.

(2) The form and method of providing the input authorized by paragraph (1).

Added Sec. 9, Ch. 833, Stats. 2000. Effective January 1, 2001.

21951. Whenever any vehicle has stopped at a marked crosswalk or at any unmarked crosswalk at an intersection to permit a pedestrian to cross the roadway the driver of any other vehicle approaching from the rear shall not overtake and pass the stopped vehicle.

21954. (a) Every pedestrian upon a roadway at any point other than within a marked crosswalk or within an unmarked crosswalk at an intersection shall yield the right-of-way to all vehicles upon the roadway so near as to constitute an immediate hazard.

(b) The provisions of this section shall not relieve the driver of a vehicle from the duty to exercise due care for the safety of any pedestrian upon a roadway.

Amended Ch. 1015, Stats. 1971. Operative May 3, 1972.

21955. Between adjacent intersections controlled by traffic control signal devices or by police officers, pedestrians shall not cross the roadway at any place except in a crosswalk.

21956. (a) No pedestrian may walk upon any roadway outside of a business or residence district otherwise than close to his or her left-hand edge of the roadway.

(b) A pedestrian may walk close to his or her right-hand edge of the roadway if a crosswalk or other means of safely crossing the roadway is not available or if existing traffic or other conditions could compromise the safety of a pedestrian attempting to cross the road.

9. FUNDING

9.1. INTRODUCTION

Funding that can be used for pedestrian projects, programs, and plans comes from all levels of government. This chapter covers federal, state, regional and local sources of pedestrian funding, as well as some non-traditional funding sources that have been used by local agencies to fund pedestrian infrastructure and programs. A matrix summarizing funding sources is provided at the end of the chapter.

9.2. FEDERAL FUNDING SOURCES

The primary federal source of surface transportation funding—including pedestrian facilities—is SAFETEA-LU, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. SAFETEA-LU is the fourth in a series of Federal transportation funding bills. The $286.5 billion SAFETEA-LU bill, passed in 2005, authorizes federal surface transportation programs for the five-year period between 2005 and 2009.

SAFETEA-LU funding is administered through the State (Caltrans and Resources Agency) and regional planning agencies. Most, but not all, of these funding programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Specific funding programs under SAFETEA-LU include:

Congestion Mitigation and Air Quality (CMAQ) — Funds projects that are likely to contribute to the attainment of national ambient air quality standards. Funds are available for projects and programs in areas that have been designated in non-attainment or maintenance for ozone, carbon monoxide or particulate matter. Since the Bay Area is in attainment of national air quality standards for all pollutants except ozone, future Bay Area eligibility for CMAQ allocations is currently being determined.

Recreational Trails Program — $370 million nationally through 2009 for non-motorized trail projects.

Safe Routes to School Program — A new program with $612 million nationally through 2009.

Transportation, Community and System Preservation Program — $270 million nationally over five years (2006-2011) reserved for transit oriented development, traffic calming and other projects that improve the efficiency of the transportation system, reduce the impact on the environment, and provide efficient access to jobs, services and trade centers.

Federal Lands Highway Funds — Federal Lands Highway funds may be used to build pedestrian facilities in conjunction with roads and parkways at the discretion of the department charged with administration of the funds. The projects must be transportation-related and tied to a plan adopted by the State and MPO. Approximately $1 billion dollars are available nationally for Federal Lands Highway Projects through 2009.

SAFETEA-LU www.fhwa.dot.gov/safetealu/index.htm

9.3. STATEWIDE FUNDING SOURCES

The State of California uses both federal sources (such as the Recreational Trails Program) and its own budget to fund pedestrian projects and programs. In some cases, such as Safe Routes to School, Office of Traffic Safety, and Environmental Justice grants, project sponsors apply directly to the State for funding. In others, such as Bay Trail grants, sponsors apply to a regional agency.

9.3.1. Recreational Trails Program (RTP)

In California, RTP funds are administered by the California State Parks Department. Recreational Trails Program funds may be used for the following:

- Maintenance and restoration of existing trails;
- Purchase and lease of trail construction and maintenance equipment;
- Construction of new trails;
- Acquisition of easements or property for trails; and
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

$3.3 million statewide was available in fiscal year 2006.

Federal Highway Administration, RTP Program
www.fhwa.dot.gov/environment/rectrails/index.htm

California State Parks, RTP Guide
http://www.parks.ca.gov/pages/1008/files/rtpguide.pdf

9.3.2. Land and Water Conservation Fund

The Land and Water Conservation Fund is a federal program that provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. The Fund is administered by the California State Parks Department and has been reauthorized until 2015.

Cities, counties and districts authorized to acquire, develop, operate and maintain park and recreation facilities are eligible to apply. Applicants must fund the entire project, and will be reimbursed for 50 percent of costs. Property acquired or developed under the program must be retained in perpetuity for public recreational use. The grant process for local agencies is competitive, and forty percent of grants are reserved for Northern California.

In 2006, approximately $480,000 is available for projects in Northern California.

California State Parks Department, Land and Water Conservation Fund Guide
www.parks.ca.gov/?page_id=21360

9.3.3. Safe Routes to School (SR2S)

In September 2004, with the passage of SB 1087 (Soto), the State extended Safe Routes to School legislation for three additional years. The bill is scheduled to sunset on January 1, 2008. This program is meant to improve the safety of walking and bicycling to school and encourage students to walk and bicycle to school through identification of existing and new routes to school and construction of pedestrian and bicycle safety and traffic calming projects. Caltrans is currently evaluating California's SR2S funding, in light of the new federal SR2S Program. Recent SAFETEA-LU legislation, which requires each state's Department of Transportation to designate a SR2S Coordinator, also contains a SR2S program. As of this printing, whether or not these programs will be combined in California or will remain autonomous has not been determined. Therefore, the amount of funds available is unknown at this point.

Caltrans, SR2S Program
www.dot.ca.gov/hq/LocalPrograms/saferoute2.htm

9.3.4. Environmental Justice: Context Sensitive Planning Grants

The Caltrans-administered Environmental Justice: Context Sensitive Planning Grants Program funds planning activities that assist low-income, minority, and Native American communities in becoming active participants in transportation planning and project development. Grants are available to transit districts, cities, counties, and tribal governments. This grant is funded by the State Highway Account at $1.5 million annually statewide. Grants are capped at $250,000.

Caltrans, Environmental Justice Program
www.dot.ca.gov/hq/tpp/offices/opar/titleVIand%20EJ.htm

9.3.5. Office of Traffic Safety (OTS) Grants

The California Office of Traffic Safety distributes federal funding apportioned to California under the National Highway Safety Act and SAFETEA-LU. Grants are used to establish new traffic safety programs, expand ongoing programs to address deficiencies in current programs. Pedestrian safety is included in the list of traffic safety priority areas. Eligible grantees include governmental agencies, state colleges and state universities, local city and county government agencies, school districts, fire departments, and public emergency services providers. Grant funding cannot replace existing program expenditures, nor can traffic safety funds be used for program maintenance, research, rehabilitation, or construction. Grants are awarded on a competitive basis, and priority is given to agencies with the greatest need. Evaluation criteria to assess need include: potential traffic safety impact, collision statistics and rankings, seriousness of problems, and performance on previous OTS grants. OTS expects to have $56 million in funding available statewide for FY 2006/07.

California Office of Traffic Safety, Grants Program
www.ots.ca.gov/grants/default.asp

9.3.6. California Center for Physical Activity Grant Program

The California Center for Physical Activity runs several programs related to walking and offers small grants to public health departments. Grants are in the amount of $4,999 dollars or less and are offered intermittently.

California Center for Physical Activity
www.caphysicalactivity.org/our_projects.html

9.4. REGIONAL FUNDING SOURCES

Regional pedestrian grant programs come from a variety of sources, including SAFETEA-LU, the State budget, vehicle registration fees and bridge tolls. Although most regional funds are allocated by regional agencies such as the Metropolitan Transportation Commission (MTC), the Bay Area Air Quality Management District (BAAQMD) and the Association of Bay Area Governments (ABAG), some (such as a portion of the regional Bicycle and Pedestrian Program) flow to county congestion management agencies, such as the Alameda County Congestion Management Agency (ACCMA), which allocate funds to project sponsors.

9.4.1. Safe Routes to Transit (SR2T)

Regional Measure 2 (RM2), approved in March 2004, raised the toll on seven state-owned Bay Area bridges by one dollar for 20 years. This fee increase funds various operational improvements and capital projects, which reduce congestion or improve travel in the toll bridge corridors.

Twenty million dollars of RM2 funding is allocated to the Safe Routes to Transit Program, which provides competitive grant funding for capital and planning projects that improve bicycle and pedestrian access to transit facilities. Eligible projects must be shown to reduce congestion on one or more of the Bay Area's toll bridges. The competitive grant process is administered by the Transportation and Land Use Coalition and the East Bay Bicycle Coalition. Competitive funding is awarded in five $4 million grant cycles. The first round of funding was awarded in December 2005. Future funding cycles will be in 2007, 2009, 2011 and 2013.

Transportation and Land Use Coalition, SR2T Program
www.transcoalition.org/c/bikeped/bikeped_saferoutes.html

9.4.2. Transportation Fund for Clean Air Program (TFCA)

TFCA funds are generated by a four-dollar surcharge on automobile registration fees in the nine-county Bay Area. Approximately $20 million is collected annually, which funds two programs: 60 percent of the TFCA monies go to the Regional Fund and 40 percent go to the County Program Manager Fund. In Alameda County, 70 percent of the Program Manager Funds are distributed to cities based on population. The remaining 30 percent are competitive funds available to transit agencies.

The Regional Fund is administered by the Bay Area Air Quality Management District (BAAQMD). In Alameda County, the Program Manager Fund is administered by the ACCMA. Pedestrian infrastructure improvements are eligible for TFCA funds through the Smart Growth funding category.

BAAQMD, TFCA Program
www.baaqmd.gov/pln/grants_and_incentives/tfca/

9.4.3. Regional Bicycle and Pedestrian Program (RBPP)

The RBPP was created in 2003 as part of the long range Transportation 2030 Plan developed by the Bay Area Metropolitan Transportation Commission. The program—currently funded with Congestion Mitigation and Air Quality funds—funds regionally significant bicycle and pedestrian projects, and bicycle and pedestrian projects serving schools or transit. $200 million dollars are committed to this program over the 25-year period. Seventy five percent of the total funds are allocated to the county congestion management agencies based on population. The remaining 25 percent of funds are regionally competitive, with the county CMAs recommending the projects to be submitted to MTC for funding consideration.

Metropolitan Transportation Commission, RBPP Program
www.mtc.ca.gov/planning/bicyclespedestrians/regional.htm#bikepedprog

9.4.4. Transportation for Livable Communities (TLC)

MTC offers two kinds of assistance through the TLC program: capital and planning. TLC funds small-scale transportation improvements that are designed to make a big difference in a community's vitality. Eligible projects include streetscape improvements, and transit-, pedestrian-oriented developments. Successful projects bring new vibrancy to downtown areas, commercial cores, and neighborhoods, making them places where people want to live, work and visit.

$27 million is the annual allocation to the TLC Program.

Metropolitan Transportation Commission, TLC Grant Program
www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm

9.4.5. The Bay Trail Project

The Bay Trail Grant program offers competitive grants to local governments, special districts and qualified nonprofit groups to build or design new Bay Trail segments. The program is structured to speed Bay Trail construction by targeting high-priority, ready to build sections and closing critical gaps; leverage state dollars with significant matching funds and in-kind contributions; foster partnership by encouraging cooperative partnerships and creative design solutions; and employ the California Conservation Corps for construction, landscaping and maintenance where possible. The amount of available funding varies, depending on State bonds and grants to the Bay Trail Project.

Bay Trail Project Grant Program
http://baytrail.abag.ca.gov/grants_2003.htm

9.5. LOCAL FUNDING SOURCES

9.5.1. TDA Article 3

Transportation Development Act (TDA) Article 3 funds are available for transit, bicycle and pedestrian projects in California. According to the Act, pedestrian and bicycle projects are allocated two percent of the revenue from a ¼ cent of the general state sales tax, which is dedicated to local transportation. These funds are collected by the State, returned to each county based on sales tax revenues, and typically apportioned to areas within the county based on population. Eligible pedestrian projects include construction and engineering for capital projects nd development of comprehensive pedestrian facilities plans. A city or county is allowed to apply for funding for pedestrian plans not more than once every five years. These funds may be used to meet local match requirements for federal funding sources.

$1.4 million of TDA Article 3 funds were allocated in Alameda County in 2006/07.

Metropolitan Transportation Commission, TDA Funding Program
www.mtc.ca.gov/funding/STA-TDA/index.htm

9.5.2. ACTIA Bicycle and Pedestrian Measure B Funding

Measure B is a sales tax measure reauthorized by Alameda County voters in 2000. It allows the collection of a ½-cent sales tax devoted to transportation projects and programs, to be collected from 2002 through 2022. The portion of Measure B funding devoted to bicycle and pedestrian improvements totals approximately $100 million, or five percent of all Measure B funding. Of this amount, 75 percent is "pass-through" funding distributed to the cities and the County according to population, and may be used for locally prioritized bicycle or pedestrian projects, programs and plans. In fiscal year 2005/06, Union City received about $185,000 in Measure B bicycle and pedestrian pass-through funds. The remaining 25 percent is available for capital projects, programs and plans of countywide significance, most of which are distributed based on a competitive grant process.

ACTIA Measure B Bicycle and Pedestrian Program
http://www.acta2002.com/bikeped.html

9.6. NON-TRADITIONAL FUNDING SOURCES

9.6.1. Integration into Larger Projects

California State's "routine accommodation" policies require Caltrans to design, construct, operate, and maintain transportation facilities using best practices for pedestrians. Local jurisdictions can begin to expect that some portion of pedestrian project costs, when they are built as part of larger transportation projects, will be covered in project construction budgets. This applies to Caltrans and other transportation facilities, such as new BART stations and Bus Rapid Transit stops.

9.6.2. Community Development Block Grants

The CDBG program provides money for streetscape revitalization, which may be largely comprised of pedestrian improvements. Federal Community Development Block Grant Grantees may use CDBG

funds for activities that include (but are not limited to) acquiring real property; building public facilities and improvements, such as streets, sidewalks, and recreational facilities; and planning and administrative expenses, such as costs related to developing a consolidated Plan and managing CDBG funds. In Oakland, CDBG funds have also been used to find crossing guards, called "Safe Walk to School Monitors."

$526 million in CDBG funds were distributed statewide in 2004/05.

CDBG program
www.hud.gov/offices/cpd/communitydevelopment/programs/index.cfm

9.6.3. REQUIREMENTS FOR NEW DEVELOPMENT

New Construction or developments must comply with City Street Improvement Ordinance in the construction of streets. With the increasing support for "routine accommodation" and "complete streets," requirements for new development, road widening, and new commercial development provide opportunities to efficiently construct pedestrian facilities. City Street Improvement Ordinance currently requires construction of new curb and gutter and sidewalk.

9.6.4. Impact Fees

An existing local source of funding for Fremont is developer impact fees, typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may attempt to reduce the number of trips (and hence impacts and cost) by paying for on- and off-site pedestrian improvements designed to encourage residents, employees and visitors to the new development to walk rather than drive. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical for avoiding a potential lawsuit.

9.6.5. Mello-Roos Community Facilities Act

The Mello-Roos Community Facilities Act was passed by the Legislature in 1982 in response to reduced funding opportunities brought about by the passage of Proposition 13. The Mello-Roos Act allows any county, city, special district, school district, or joint powers of authority to establish a Community Facility Districts (CFD) for the purpose of selling tax-exempt bonds to fund public improvements within that district. CFDs must be approved by a two-thirds margin of qualified voters in the district. Property owners within the district are responsible for paying back the bonds. Pedestrian facilities are eligible for funding under CFD bonds.

Mello-Roos Fact Sheet
http://mello-roos.com/pdf/mrpdf.pdf

9.6.6. FUNDING SUMMARIES

Funding by Project Type

A listing of project types and corresponding potential funding sources is available from the Pedestrian and Bicycle Information Center. The matrix lists 35 different types of pedestrian and bicycle projects and identifies the federal funds that are most appropriate for each type of project.

Walkinfo.org Federal Funding Matrix
http://www.walkinginfo.org/pp/funding/gov/popups/matrix.htm

Matrix of Funding Sources

The matrix on the next page provides detailed information for the funding sources listed in the preceding section. Beside each source is the corresponding application deadline, the allocating agency, the amount available, matching requirements, eligible applicants, eligible projects and comments, including agency contact information.

Table 9-1:
Funding Sources

Acronyms:	Jurisdictions for City of Union City, California:
AQMD - Air Quality Management District Caltrans - California Department of Transportation CMAQ - Congestion Management and Air Quality CTC - California Transportation Commission FHWA - Federal Highway Administration STANCOG – Stanislaus Council of Governments RTPA - Regional Transportation Planning Agency State DPR - California Department of Parks and Recreation (under the State Resources Agency) TEA-21 - Transportation Equity Act of the 21st Century	Caltrans - Caltrans District 4 ABAG—Association of Bay Area Governments ACTIA—Alameda County Transportation Improvement Authority MTC—Metropolitan Transportation Commission Resources: Caltrans TEA-21 website - http://www.dot.ca.gov/hq/TransEnhAct/

Grant Source	Application Deadline	Agency	Program Funds Available	Matching Requirement	Eligible Applicants	Commute	Recreation	Safety/ Education	Comments/Contact Information
Federal Funding									
Federal Lands Highway Funds		FHWA	$1 billion dollars total nationwide through 2009	None	State	X	X	X	Project must appear in STIP. Contact California Division, FHWA http://www.fhwa.dot.gov/cadiv/directory.htm
Transportation and Community and System Preservation Program (TCSP)	Varies	FHWA	$61.25 million annually nationwide through 2008/09	20% local match	state, local, MPOs	--	--	--	Projects that improve system efficiency, reduce environmental impacts of transportation, etc. Contact Kenneth Petty TCSP Program Officer, Office of Planning phone: (202) 366-6654 http://www.fhwa.dot.gov/tcsp/pi_tcsp.htm
State Funding									
California Center for Physical Activity Grant Program	Ongoing	Department of Health Services	Up to $4,999 per grantee	None	Public Health Departments			X	For pedestrian encouragement programs Contact: Lisa Cirill, Acting Chief lcirill@dhs.ca.gov 916.552-9943

Grant Source	Application Deadline	Agency	Program Funds Available	Matching Requirement	Eligible Applicants	Commute	Recreation	Safety/ Education	Comments/Contact Information
Coastal Conservancy Non-Profit Grants Program	Ongoing	Coastal Conservancy	Grants range from $10,000 to several million	Not required but favored	California non-profit 501 (c) 3 organizations		X		Funds for trail planning and construction and restoration of coastal urban waterfronts. Contact Janet Diehl jdiehl@scc.ca.gov
Environmental Enhancement and Mitigation Program (EEMP)	Currently suspended (as of mid-2006)	State Resources Agency, Caltrans	$10 million statewide	Not required but favored	local, state and federal government non-profit agencies	X	X	X	Projects that mitigate environmental impacts of planned transportation projects; can include acquisition or development of roadside recreational facilities. Contact Carolyn Dudley, State Resources Agency, (916) 653-5656
Environmental Justice Grants: Context Sensitive Planning	October 14	Caltrans	$1.5 million statewide	10% local	MPA, RPTA, city, county, tribal govmts, transit districts	X	X	X	Funds activities that include low-income and minority communities in transportation planning and project development. Contact Norman Dong at norman_dong@dot.ca.gov or (916) 651-6889.
Land and Water Conservation Fund (LCWF)	May 1	California DPR	$480,000 for Northern California (2006)	50% match	Cities, counties, park districts		X		Recreational trails are eligible for funding. Applicants must fund the entire project, and will be reimbursed for 50% of costs.
Office of Traffic Safety Grants	Jan. 31	Office of Traffic Safety	$56 million statewide (FY 2006/07)	None	Govmtal agencies, state colleges, and state universities, local city and county government agencies, school districts, fire			X	Grants are used to mitigate traffic safety program deficiencies, expand ongoing activity, or develop a new program. Grant funding cannot replace existing program expenditures, nor can traffic safety funds be used for program maintenance, research, rehabilitation, or construction. Contact OTS Regional Coordinator Lisa Dixon at, (916) 262-0978 or ldixon@ots.ca.gov

Grant Source	Application Deadline	Agency	Program Funds Available	Matching Requirement	Eligible Applicants	Commute	Recreation	Safety/ Education	Comments/Contact Information
					depts, and public emergency services providers				
Recreational Trails Program (RTP)	Oct. 1	State DPR	$3.3 million statewide (FY 2006)	20% match	jurisdictions special districts, non profits with mngmt responsibil-ities over the land		X		For recreational trails to benefit bicyclists, pedestrians, and other users; contact State Dept. of Parks & Rec. , Statewide Trails Coordinator, (916) 653-8803
Safe Routes to School (AB 1475/SB1087)	May 31	Caltrans	Statewide amount unclear as of mid-2006	11.5% min.	city, county	X	X	X	Primarily construction program to enhance safety of pedestrian and bicycle facilities. Contact. Caltrans District 4, (510) 286-5598
Regional Funding									
The San Francisco Bay Trail Project	Varies	The San Francisco Bay Trail Project/ ABAG	Total available varies from year to year		Public Agencies, Land Trusts, Non-profits	x	x		Funds trail planning and construction projects to complete gaps in the Bay Trail. Contact Laura Thompson laurat@abag.ca.gov
Regional Bicycle and Pedestrian Program (RBPP) – Local Pass-Through	Varies	ACCMA, MTC	$6 million annually region-wide	11.5%	Cities, school districts, transit districts	X		X	Constructing regionally significant pedestrian projects and bicycle/pedestrian projects serving schools or transit.
Regional Bicycle and Pedestrian Program (RBPP)	Varies	ACCMA, MTC	$2 million annually region-wide	11.5%	Cities, school districts,	X		X	Constructing regionally significant pedestrian projects and bicycle/pedestrian projects serving schools or transit.

Grant Source	Application Deadline	Agency	Program Funds Available	Matching Requirement	Eligible Applicants	Commute	Recreation	Safety/ Education	Comments/Contact Information
– Regional Projects					transit districts				
Safe Routes to Transit	Varies	MTC, Administered by TALC	$4 million annually region-wide	None required, but scoring preference given to projects with outside match	Public agencies in all 9 Bay Area counties. Non-profits must partner with a public agency to apply.	X			Applications must demonstrate bridge congestion reduction on at least one state-owned Bay Area bridge. Contact the Transportation and Land Use Coalition or Dave Campbell (East Bay Bicycle Coalition) sr2t@transcoalition.org dcampbel@lmi.net
Transportation Fund for Clean Air (TFCA), Program Manager Fund	January in Alameda County, varies in other counties	ACCMA, BAAQMD	Approx. $8 million annually region-wide	None	Cities, counties, school districts, transit districts	X			Smart growth projects: Physical improvements that support development projects and/or calm traffic, resulting in the achievement of motor vehicle emission reductions.
Transportation Fund for Clean Air (TFCA), Regional Fund	May 1st	BAAQMD, ACCMA	Approx. $10 million annually region-wide	10% for requests greater than $150,000	Cities, county, school districts, transit districts	X			Smart growth projects: Physical improvements that support development projects and/or calm traffic, resulting in the achievement of motor vehicle emission reductions. www.baaqmd.gov/pln/grants_and_incentives/tfca/regional_fund.htm
Transportation for Livable Communities Program	June	MTC	$27 million annually region-wide	Local match of 11.5% is required	Public Agencies. Non-profits and other CBOs may partner with public agency to	x		x	Funds for transportation projects that revitalize downtown areas, commercial cores, neighborhoods, and transit corridors. www.mtc.ca.gov/planning/smart_growth/tlc_grants.htm

Grant Source	Application Deadline	Agency	Program Funds Available	Matching Requirement	Eligible Applicants	Commute	Recreation	Safety/ Education	Comments/Contact Information
					apply.				
Local Funding									
ACTIA Bicycle and Pedestrian Measure B Funding	Varies	ACTIA	Union City received $185,000 in FY 2005/06	No match is required; however projects with a match will score better.	Any public agency that operates in Alameda County.	X	X	X	All projects must demonstrate countywide significance. Contact Rochelle Wheeler rwheeler@actia2022.com
Transportation Development Act (TDA) Article 3	January	MTC/ Alameda County PWA	$1.4 million in Alameda County (2006/07)	--	Alameda County	X		X	Contact Ruben Izon rubeni@acpwa.org
Nontraditional Sources									
Community Development Block Grants	Varies	HUD	$526 million statewide (2004/05)	None, but may be used as evaluation criteria	Public entities and 501(c)(3) non-profits and tax-exempt faith-based religious orgs				Primarily for community revitalization, but may be used to fund streetscape improvements, to eliminate slum and blight in low- and moderate-income areas.
Mello-Roos Community Facilities Act	None	Various Public Agencies	Varies	None		X	X	X	Primarily used to fund public services such as libraries and fire depts., but may fund pedestrian infrastructure.

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APPENDIX A: PEDESTRIAN DESIGN GUIDELINES

A. PEDESTRIAN DESIGN GUIDELINES

A.1. RATIONALE FOR THE DESIGN GUIDELINES

Pedestrian design guidelines are one effective strategy for improving the overall urban and suburban environment for walking. Other strategies such as enforcement of existing traffic laws, and public information and education are addressed in Chapter 6. The following guidelines recommended for use by the City of Fremont primarily address issues of pedestrian safety. The guidelines do not thoroughly address issues of urban design, design character, or the many other amenities that make streets and sidewalks attractive places to travel and spend time as a pedestrian. It is clear that safety concerns can significantly influence a person's decision to walk or use other modes of transportation, thus design guidelines for creating a safe pedestrian environment are an important step for all communities.

Even though pedestrians are legitimate roadway users, they are frequently overlooked in the quest to build more-sophisticated transportation systems. Whether building new infrastructure or renovating existing facilities, it should be assumed that people will walk, and plans should be made to accommodate pedestrians. Where people aren't walking, it is often because they are prevented or discouraged from doing so. Either the infrastructure is insufficient, has serious gaps, or there are safety hazards.

These design guidelines present many design and infrastructure improvements that will help the City of Fremont to circumvent this pattern and initiate a new trend in roadway design to better accommodate pedestrians and build a stronger walking community.

The guidelines included in this chapter are supplemental to the City of Fremont's **Development Policies, March 2002** City Standard Details, and State and Federal standards. In all cases the City's standards provide minimum and maximum dimensions for all pedestrian infrastructure. The purpose of this chapter is not to replace City standards, but to provide general design guidelines pedestrian for facilities that go above the minimum standards. Implementation of guidelines shown herein require the approval of the City Engineer.

A.2. STATE AND FEDERAL GUIDELINES

The design of many streetscape elements is regulated by state and federal law. Traffic control devices must follow the procedures set forth in the Manual of Uniform Traffic Control Devices (MUTCD), while elements such as sidewalks and curb cuts must comply with guidelines implementing the Americans with Disabilities Act (ADA).

A.2.1. Manual of Uniform Traffic Control Devices

The City of Fremont follows the procedures and policies set out in the CA MUTCD (state) and MUTCD (federal). Traffic control devices include traffic signals, traffic signs, and street markings. The manual covers the placement, construction, and maintenance of devices. The CA MUTCD emphasizes uniformity of traffic control devices to protect the clarity of their message. A uniform device conforms to regulations for dimensions, color, wording, and graphics. Uniformity also means treating similar situations in the same way.

A.2.2. Americans with Disabilities Act

Title II of the Americans with Disabilities Act (ADA), signed into law in 1990, is a civil rights act that prohibits public entities from discrimination on the basis of disability. Newly constructed facilities must be free of architectural barriers that restrict access or use by individuals with disabilities. Cities in California uses two technical standards for accessible design: the Americans with Disability Act Accessibility Guidelines (ADAAG), adopted by the Department of Justice for places of public accommodation and commercial facilities covered by Title 3 of the ADA, and the California Title 24 State Accessibility Standards, State Architectural Regulations for Accommodation of the Physically Handicapped in Public Facilities.

A.3. PRINCIPLES FOR PEDESTRIAN DESIGN

The following design principles represent a set of ideals which should be incorporated, to some degree, into every pedestrian improvement. They are ordered roughly in terms of relative importance.

1. **The pedestrian environment should be safe.**

   Sidewalks, walkways, and crossings should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic, and protruding architectural elements.

2. **The pedestrian network should be accessible to all.**

   Sidewalks, walkways, and crosswalks should ensure the mobility of all users by accommodating the needs of people regardless of age or ability.

   The pedestrian network should connect to places people want to go. The pedestrian network should provide continuous direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, recreational opportunities and transit.

3. **The pedestrian environment should be easy to use.**

   Sidewalks, walkways, and crossings should be designed so people can easily find a direct route to a destination and will experience minimal delay.

4. **The pedestrian environment should provide good places**.

   Good design should enhance the look and feel of the pedestrian environment. The pedestrian environment includes open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street. Amenities such as seating, street furniture, banners, art, plantings, shading, and special paving, along with historical elements and cultural references, should promote a sense of place.

5. **The pedestrian environment should be used for many things.**

The pedestrian environment should be a place where public activities are encouraged. Commercial activities such as dining, vending, and advertising may be permitted when they do not interfere with safety and accessibility.

6. **Pedestrian improvements should preserve or enhance the historical qualities of a place and the City.**

   Fremont's history must be preserved in the public space. Where applicable, pedestrian improvements should restore and accentuate historical elements of the public right-of-way. Good design will create a sense of time that underscores the history of Fremont.

7. **Pedestrian improvements should be economical.**

   Pedestrian improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements.

A.4. SIDEWALK CORRIDOR GUIDELINES

The width and zone guidelines presented in this sidewalk section would apply to sidewalks in new development areas, redevelopment areas, and in areas where street reconstruction is planned. For the entire above listed project types, sufficient right of way must exist for implementation of the appropriate sidewalk width guideline.

A.4.1. Sidewalk Corridor Width

Proposed sidewalk guidelines apply to new development and depend on available street width, motor vehicle volumes, surrounding land uses, and pedestrian activity levels. Standardizing sidewalk guidelines for different areas of the City, dependent on the above listed factors, ensure a minimum level of quality for all sidewalks.

The City of Fremont currently requires 5-foot wide sidewalks. These dimensions conform to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) that call for minimum 4-foot wide sidewalks for passage, not sidewalk width recommendations.

The Institute of Transportation Engineers (ITE) recommends planning all sidewalks to include a minimum width of 5 feet (60 inches) with a planting strip of 2 feet (24 inches) in both residential and commercial areas.

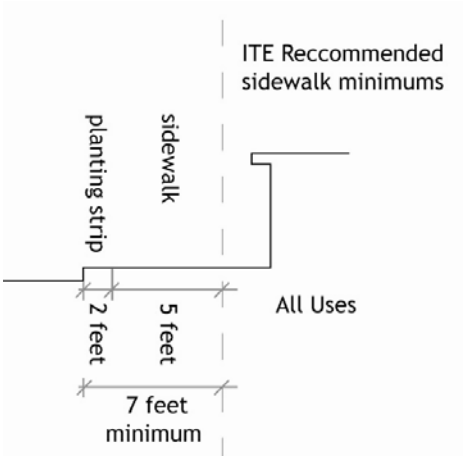


Figure A-1
ITE Recommended Sidewalk Widths

The recommended minimum corridor width for a sidewalk is presented in Table A-1.

A.4.2. Sidewalk Zones

Sidewalks are the most important component of Fremont's pedestrian circulation network. Sidewalks provide pedestrian access to virtually every activity and provide critical connections between other modes of travel, including the automobile, public transit, and bicycles. The Sidewalk Corridor is typically located within the public right-of-way between the curb or roadway edge and the property line. The Sidewalk Corridor contains four distinct zones: the Curb Zone, the Furnishings Zone, the Through Pedestrian Zone, and the Frontage Zone.

Curb Zone

Curbs prevent water in the street gutters from entering the pedestrian space, discourage vehicles from driving over the pedestrian area, and make it easy to sweep the streets. In addition, the curb helps to define the pedestrian environment within the streetscape, although other designs can be effective for this purpose. At the corner, the curb is an important tactile element for pedestrians who are finding their way with the use of a cane. Strait curbs rather than rolled curbs are strongly recommended because it eliminates the potential for cars to park on the sidewalk or partially obstructing the sidewalk.

Furnishings Zone

All streets require a utility zone to accommodate above ground public infrastructure, signage, and street trees. Locating this infrastructure in the furnishings zone prevents it from encroaching on the through passage zone, where it is likely to cause accessibility issues. The furnishings zone also creates an important buffer between pedestrians and vehicle travel lanes by providing horizontal separation. Elements like utility poles, sign posts, and street trees improve pedestrian safety and comfort by further separating the sidewalk from moving vehicles. Landscape elements are addressed in Section 8.6. Guidelines for furnishings zone widths are presented below in Table A-1.

Through Passage Zone

Most residential areas in Fremont are low to medium density and therefore have low pedestrian volumes, compared to more urban areas. A five foot through passage zone is recommended for these conditions. Some commercial areas, school zones, and other public areas generate greater pedestrian volumes and should have a wider through zone. Table A-1 presents recommended standards for the through zone width for each of the predominant land uses in Fremont.

Frontage Zone

The frontage zone is the space between the pedestrian through zone and the adjacent property line. Pedestrians tend to avoid walking close to barriers at the property line, such as buildings, storefronts, walls or fences, in the same way that they tend to avoid walking close to the roadway. In most cases the frontage zone should be at least 12 inches. However, if the sidewalk is adjacent to a wide open or landscaped space, such as in residential areas where fences are not typically found or not allowed, the frontage zone can be eliminated. Guidelines for frontage zone widths are presented below in Table A-1. As shown in the table, a frontage zone may not be required in many residential areas of Fremont due to presence of deep front yard setbacks and the prevailing development standard that does not include front yard fencing.

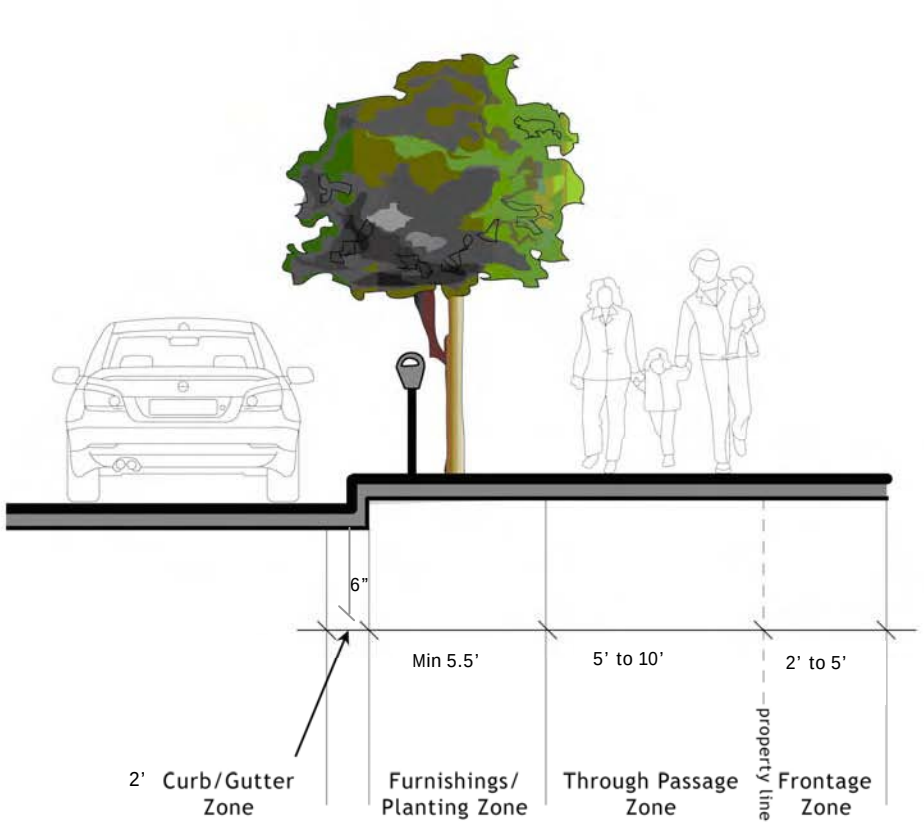


Figure A-2
Sidewalk Zones

Table A-1
Recommended Zone Widths By Street Type

Street Type	Curb Zone	Furnishing/Planting Zone	Through Passage Zone	Frontage Zone	Total Pathway Width
Arterial (City) and Collector Street	2 ft.	5.5 ft.	10 ft.	2.5 ft.	18 ft.
Local Neighborhood Street	2 ft.	5.5 ft.	5 ft.	none	10.5 ft.
Commercial Walkways**	2 ft.	5.5 ft.	10 ft.	2.5 ft.	18 ft.
Multi-Use Trail*	NA	NA	10 ft.	NA	10 ft.

A.4.3. Furnishings Zone

Figure A-3
Furnishing Zone

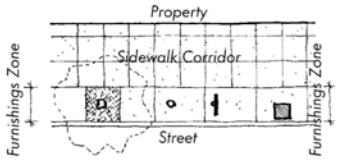
The Furnishings Zone buffers pedestrians from the roadway and is the place for elements such as street trees, poles, parking meters, and street furniture.

The Furnishings Zone buffers pedestrians from the adjacent roadway, and is also the area where elements such as street trees, signal poles, utility poles, street lights, controller boxes, hydrants, signs, parking meters, driveway aprons, grates, hatch covers, and street furniture are properly located. This is the area where people alight from parked cars.

Wherever it is wide enough, the Furnishings Zone should include street trees. In commercial areas, this zone may be paved, with tree wells and planting pockets for trees, flowers, and shrubs. In other areas, this zone generally is not paved except for access walkways, but is landscaped with some combination of street trees, shrubs, ground cover, lawn, or other landscaping treatments.

Separating pedestrians from travel lanes greatly increases their comfort as they use the Sidewalk Corridor. This buffer function of the Furnishings Zone is especially important on streets where traffic is heavy, yet along many of these streets the existing Sidewalk Corridor is narrow. Where possible, additional width should be given to this zone on streets with traffic speeds over 35 mph (55 km/h).

Figure A-4
Furnishing Zone
Alignment



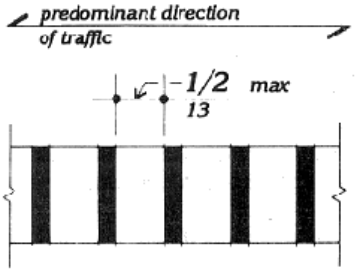
Typical alignment of the Furnishings Zone within the Sidewalk Corridor

Grates

All grates within the sidewalk shall be flush with the level of the surrounding sidewalk surface, and shall be located outside the Through Pedestrian Zone. Ventilation grates and tree well grates shall have openings no greater than 1/2 in (13 mm) in width.

Designers should use tree well grates in High Pedestrian Use areas.

A-5
Ventilation Grates



Hatch Covers

Hatch covers should be located within the Furnishings Zone. Hatch covers must have a surface texture that is rough, with a slightly raised pattern. The surface should be slip-resistant even when wet. The cover should be flush with the surrounding sidewalk surface.

Street Furniture

Street furniture includes benches, mailboxes, trash and recycling receptacles, bike racks, newspaper boxes, drinking fountains, information boards, kiosks, parking meters, artwork, public phones, signs, bus shelters, and other items used by pedestrians. These features humanize the scale of a street and encourage pedestrian activity. Street furniture should be placed in the furnishings zone to maintain through passage zones for pedestrians and to provide a buffer between the sidewalk and the street. For bus shelters on crowded sidewalks, bus bulb-outs are recommended for providing additional space. (See the explanation of bulb-outs on page A-17.) Bus shelters should also have clearly displayed bus schedules and city maps for way-finding. Pedestrian facilities around all street furniture should meet accessibility requirements and pedestrian walk clearance zones.

Figure A-6
Examples of Street Furniture

Utility Poles and Structures

The City's underground and overhead network of utility services greatly impacts sidewalks. Utility poles, traffic signals, and fire hydrants should be installed outside the pedestrian travel zone. Electrical boxes should be located on utility and traffic signal poles so they do not create unexpected hazards to pedestrians. Utility vaults and access boxes should be located outside the pedestrian travel zone and be constructed from non-slip materials that are flush with the sidewalk, in conformance with ADA requirements.

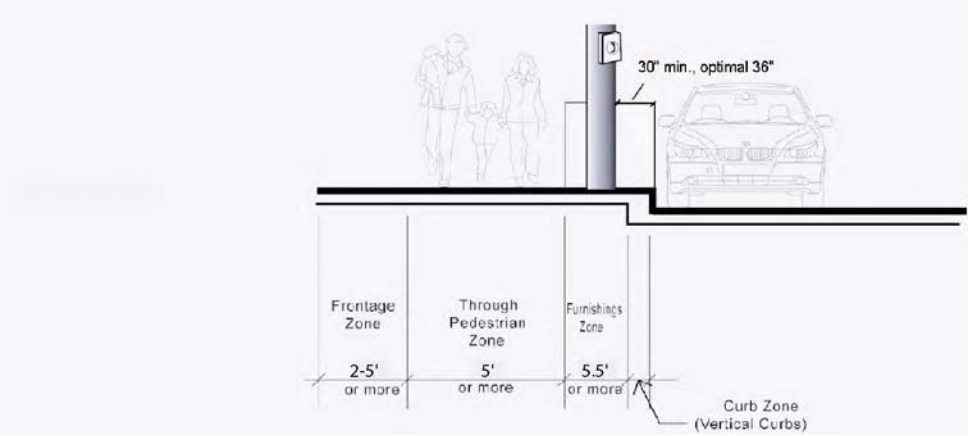


Figure A-7
Utility Poles and Structure Placement

A.4.4. Through Pedestrian Zone

The Through Pedestrian Zone is the area intended for pedestrian travel. This zone should be entirely free of permanent and temporary objects.

For sidewalk infill projects in areas with some existing sidewalks, the new sidewalk should match the existing width or meet the recommended width whichever is larger.

Driveway aprons should not intrude into the Through Pedestrian Zone.

ADA Accessibility Guidelines specify that the minimum clearance required for through passage is 36 inches. A minimum clearance of 32 inches is allowed, but only up to a length of 24 inches.

Surfaces

Walking surfaces shall be firm and stable, resistant to slipping, and allow for ease of passage by people using canes, wheelchairs, or other devices to assist mobility.

Sidewalks are generally constructed of Portland cement concrete. Brick or concrete unit pavers may also be used, at the discretion of the City Engineer, particularly in the Furnishings Zone or around mature trees where sidewalk lifting is a problem.

The surface of concrete sidewalks should be scored to match historic patterns within a neighborhood or district where appropriate.

The Through Pedestrian Zone is the area of the Sidewalk Corridor intended for pedestrian travel.

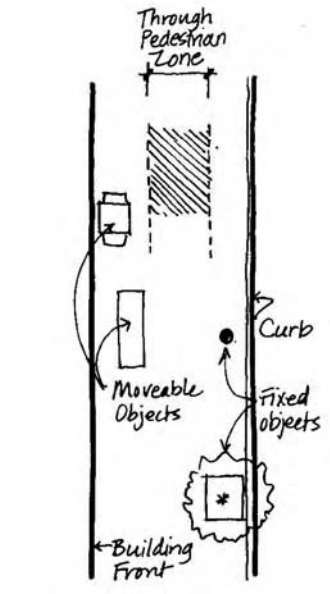


Figure A-8
Through Pedestrian Zone

Typical alignment of the Through Pedestrian Zone within the Sidewalk Corridor.

Table A-2
Sidewalk Materials

Concrete	
Where to Use	Preferred material for use on standard city sidewalks.
Maintenance Life	75 years plus
Comparative Cost (2007)	$10/sq ft
Concrete Pavers	
Where to Use	Acceptable material for use on sidewalks where aesthetic treatment is desired, at the discretion of the City Engineer. May be best suited for the Furnishings Zone as streetscape accent where pedestrian through travel is not expected.
Maintenance Life	20 years plus
Comparative Cost (2007)	$15/sq ft
Rubber Sidewalk	
Where to Use	Experimental sidewalk material being applied in select locations in cities including Berkeley, Santa Monica and Washington DC, where cracking and tree root uplifting are problems.
Maintenance Life	Insufficient data
Comparative Cost (2007)	$15/sq ft
Asphalt	
Where to Use	Preferred material for use on any widened shoulder alternative pathway. Acceptable but not preferred as a material for separated alternative pathways or connector paths. Asphalt patch may be used for use for City standard sidewalk only for temporary repair.
Maintenance Life	10 years plus
Comparative Cost (2007)	$5/sq ft

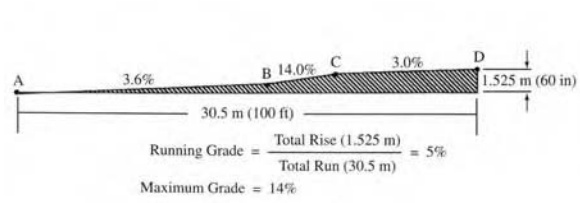


Figure A-9
Running Grade and Maximum Grade

Grade

The grade of a sidewalk is important because of the issues of control, stability, and endurance. Gentle grades are preferred to steep grades so as to make it possible for people to go up hill, so that they don't lose control on the downhill, and so that they don't lose their footing.

- Grade is the slope parallel to the direction of travel.
- Running grade is the average grade along a continuous path.
- Maximum grade covers a limited section of sidewalk that exceeds the running grade. It is measured over 24 in (0.610 m). The above figure illustrates running grade and maximum grade. Rate of change of grade is the change of grade over a distance of 24 in (0.610 m) intervals.
- Counter slope is the grade running opposite to the running grade.
- New sidewalks must be built to comply with these grade requirements and approval of the City Engineer. However, in a steep area with existing roadways, exceptions are allowed. Staircases and/or elevators can provide an alternative.

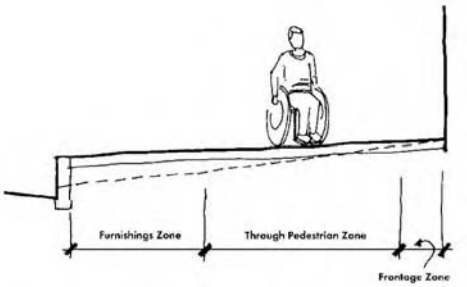
Cross Slope

Cross-slope affects the stability of wheelchairs, walking aids, and people who have difficulty walking but don't use aids. All sidewalks require some cross-slope for drainage, but cross-slope that is too great presents problems for disabled users. The recommended cross-slope for sidewalks is 2%. The preferred cross slope for the entire paved sidewalk corridor is 1:50. If a greater slope is anticipated because of unusual topographic or existing conditions, the designer should maintain the preferred slope of 1:50 within the entire Through Pedestrian Zone, if possible.

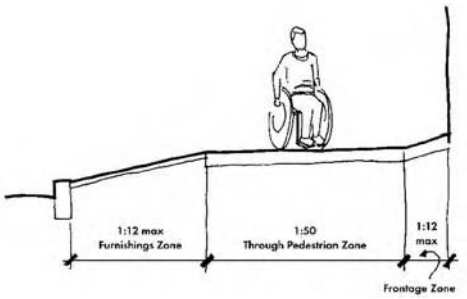
This can be accomplished either by raising the curb so that the cross-slope of the entire sidewalk can be 1:50, or by placing the more steeply angled slope within the Furnishings Zone and/or the Frontage Zone (see illustration).

If the above measures are not sufficient and additional slope is required to match grades, the cross slope within the Through Pedestrian Zone may be as much as 1:25, provided that a 3 ft (900 mm) wide portion within the Through Pedestrian Zone remains at 1:50 cross slope, as shown in the illustration.

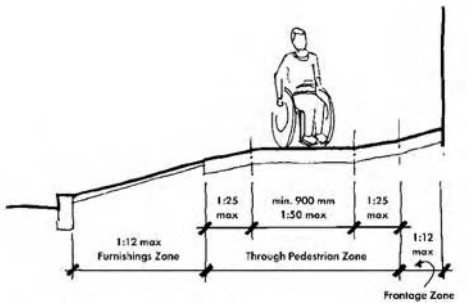
Note: Use of cross slope guidelines herein shall require approval of City Engineer.



Raising the curb is one approach to maintaining the preferred cross slope.



The Furnishings Zone and the Frontage Zone may be sloped more steeply, provided the preferred cross slope is maintained in the Through Pedestrian Zone.



If necessary, the Through Pedestrian Zone may contain slopes up to 1:25, provided a 900 mm (3'-0") wide area with a cross slope of no more than 1:50 is maintained within the zone.

Figure A-10
Cross Slope

A.4.5. Frontage Zone

The Frontage Zone is the area between the Through Pedestrian Zone and the property line. This zone allows pedestrians a comfortable "shy away" distance from the building fronts, in areas where buildings are at the lot line, or from elements such as fences and hedges on private property.

Temporary uses such as sidewalk cafes may occupy the Frontage Zone, providing the Through Pedestrian Zone remains clear.

Elements such as standpipe systems may project into the Frontage Zone. Care must be taken to assure compliance with the ADA.

Where no Furnishings Zone exists, elements that would normally be sited in that zone, such as transit shelters and benches, telephone kiosks, signal and street lighting poles and controller boxes, traffic and parking signs, and utility poles, may occupy the Frontage Zone. In some cases, easements or additional right-of-way may be required to allow for these items. For residential and mixed-use building built to the right-of-way line, these elements should not be sited in the Frontage Zone, as they could block access to an existing or future building.

Private temporary uses such as sidewalk cafes (where allowed by Code) may occupy the Frontage Zone, so long as the Through Pedestrian Zone is maintained.

Encroachments

Fences and walls, when permitted, should be at least 1 ft (300 mm) behind the back of the sidewalk (or the future sidewalk, if none exists). Encroachments into the right-of-way should not be permitted where the existing sidewalk corridor is less than the recommended width. Property owners should check with the City Planning Department in identifying property lines.

Elements such as standpipe systems for fire safety may project into the Frontage Zone from a building face a maximum of 1 ft (300 mm) per the City Engineer, but not more than 4 in (100 mm) if they project in the area between 2 ft 3 in and 6 ft 8 in (685 mm and 2030 mm) above the sidewalk, per the ADA.

A.5. RAILROAD CROSSINGS

At-grade railroad tracks can be hazardous for pedestrians to cross. Improvements can be made to alert pedestrians that they are crossing tracks and that there is an oncoming train. One example is recommended in the Projects Chapter of this Plan, truncated domes at crossings. Truncated domes help alert pedestrians as they are walking to cross the tracks with some caution. There are also other improvements that can help warn pedestrians of railroad crossings, such as signage. Railroad crossing warning signs can be placed near the sidewalk/railroad crossing. Another improvement is an arm that crosses the sidewalk when a train is approaching like arms that lower to stop vehicles approaching at-grade crossings. **Figure A-11 Railroad Arm on Sidewalk** shows how these railroad arms are attached to the same pole as the arm to stop vehicles and they cross the sidewalk, warning pedestrians of a train.

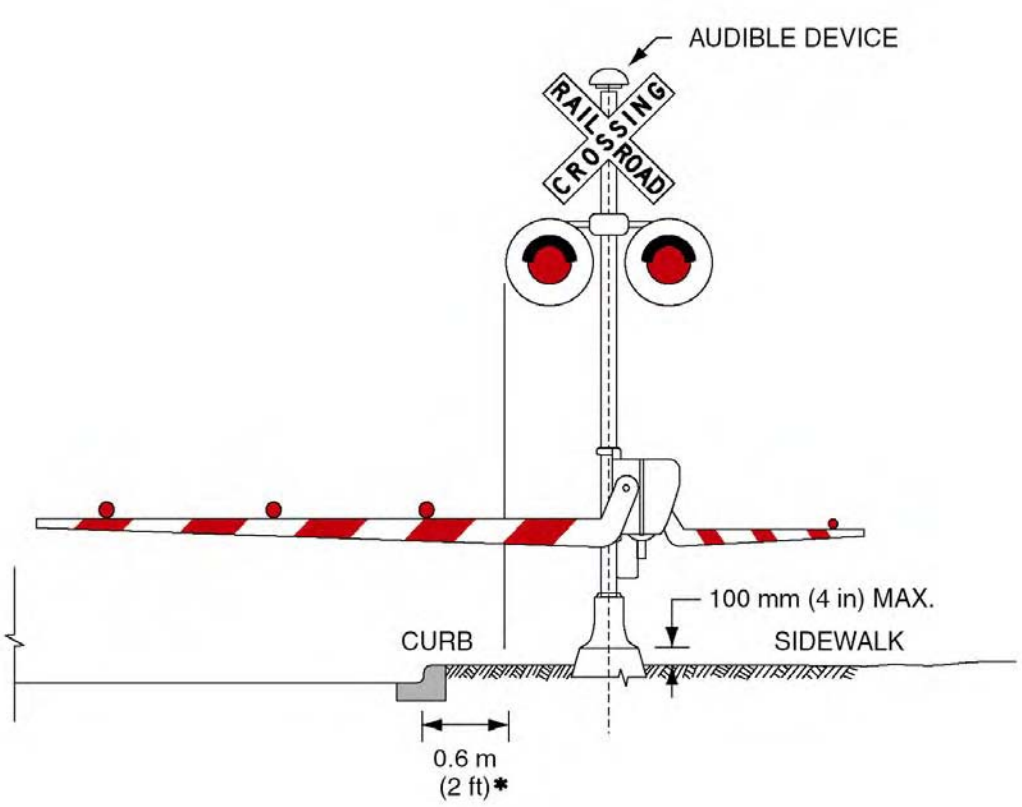


Figure A-11
Railroad Arm on Sidewalk

A.6. SIDEWALK LIGHTING

Improving street lighting makes locations appear more inviting and will encourage people to use pedestrian areas at night. An increase in the number of people using a particular area reinforces general safety by eliminating opportunities for crimes to occur.

Street lighting is designed to serve a variety of purposes. Some designers use lamp styles to provide a sense of neighborhood continuity or preserve the atmosphere of an historic district. Others use lights to improve visibility for motorists at a particular intersection.

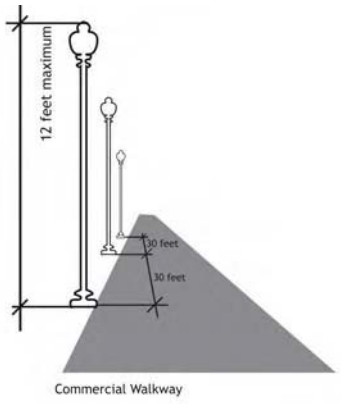


Figure A-12
Lighting Placement

Pedestrian scale lighting is addressed specifically in this section, as typical roadway right-of-way lighting designed to benefit motorists is of little value to pedestrians. From the pedestrian's point of view, frequent lampposts of lower height and illumination are preferred over fewer lampposts that are taller and brighter.

Pedestrian scale lighting should be used in areas of high pedestrian activity and where feasible based on available right of way, utilities and cost. Pedestrian scale lighting is a significant capital improvement and should be planned only where it will have a maximum benefit. The areas in Fremont that may benefit from increased pedestrian lighting surround uses active in the evening such as entertainment districts that include theatres, restaurants and bars or parks with evening programs. Pedestrian scale lighting may also benefit the pedestrian districts where they do not exist already.

Pedestrian scale lighting may be installed between existing lampposts to obtain the frequencies given in the table above. They must be located at least ten feet from the full growth canopy of adjacent trees.

The City has minimum lighting standards included in the Municipal Code. This section is intended to provide guidelines for additional lighting to create a more pedestrian friendly environment.

A.7. LANDSCAPE

Trees can help creaste a more attractive streetscape, providing visual relief year round and shade in summer, improving air quality, and creating a buffer between pedestrians and automobiles. The City of Fremont's Landscape Development Requirements & Policies are in the municipal code and are available online at: http://www.ci.fremont.ca.us/CityHall/Departments/Engineering.htm#landscape.

A.8. BICYCLE PARKING

Many errands are multi-modal, involving walking and some other transport including vehicles, transit, or bicycle. Placing bicycle parking adjacent to store fronts, shopping centers or post offices may encourage people to bicycle to places that are too far to walk and too close for driving. To facilitate walking-bicycling trips, bicycle parking spaces can be installed in any of the zones identified except the "Through Passage Zone". If installed in the curb zone, racks must be a minimum of 3.5 feet from the curb and cannot obstruct the path of travel. On narrow sidewalks, bicycle parking is oriented so the locked bicycle is parallel to the pedestrian traffic flow. On streets with very wide sidewalks, bicycle parking may also be oriented with locked bicycles perpendicular to the right-of-way as long as they do not project into the pedestrian travel zone. Private property owners are also encouraged to provide bicycle parking for use by the public on their land within the "Frontage Zone". Such parking should be installed so that locked bicycles do not project into the sidewalk. Bicycle parking rings on posts are designed to prevent bicycles from falling and becoming an obstacle to walking.

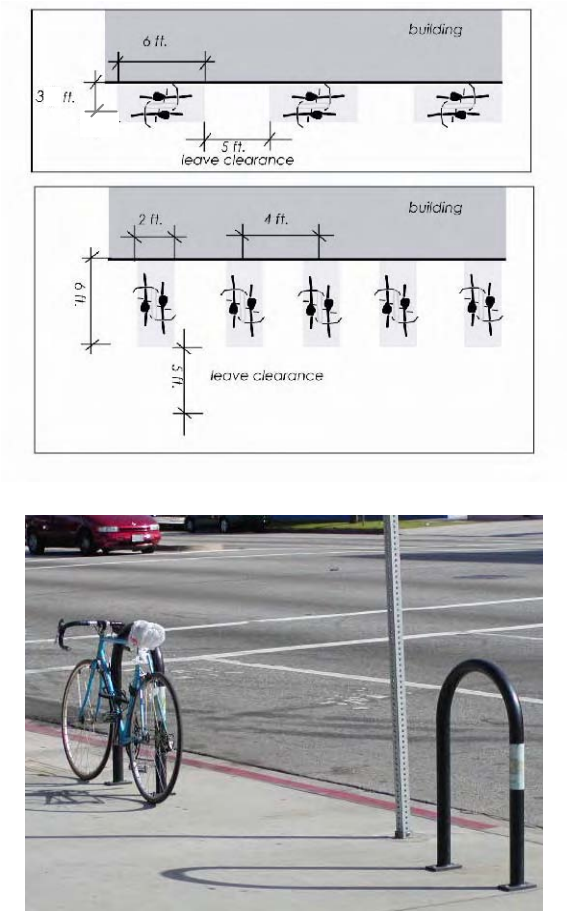


Figure A-13
Typical Bicycle Parking Facility Dimensions

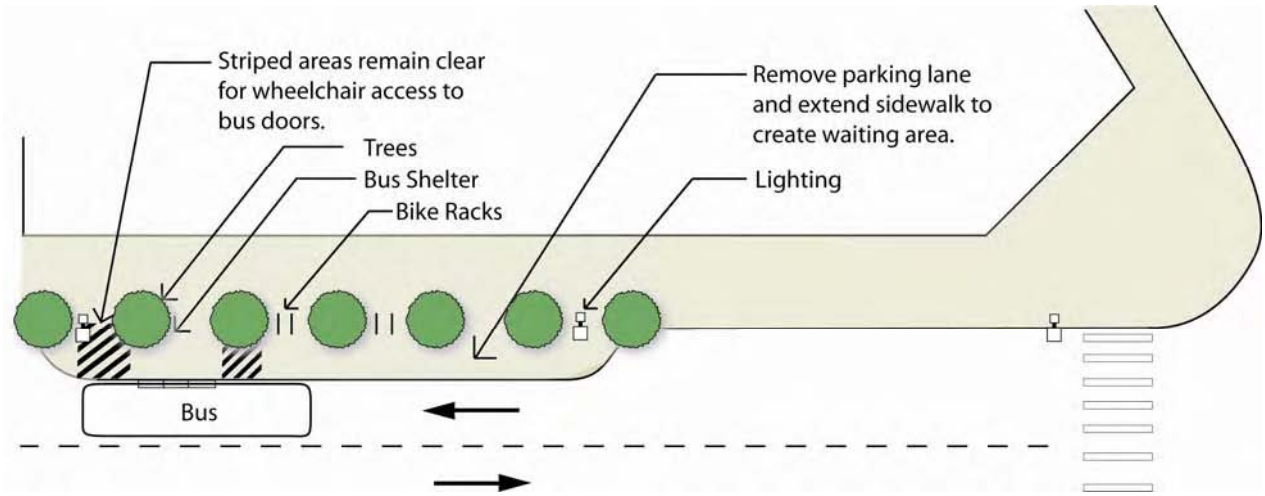
A.9. TRANSIT STOPS

Bus bulb outs can provide safe access for transit passengers. Bus bulb outs should be designed such that pedestrians in wheelchairs can access the bus shelter and board the bus, as shown below in **Figure A-14**. At transit stops where neither a bus turnout nor bus bulb out can be accommodated; buses are often unable to pull directly adjacent to the curb to deploy a lift. Curb ramps in such locations allow wheelchair users to board the bus from the street; if a bus stop is not adjacent to a corner curb ramp, a curb ramp at the bus stop should be provided.

ADA Guidelines define the amount of space necessary next to bus shelters to facilitate the lift operations for passengers in wheelchairs. The ADA minimum requirements for this space are 60 inches wide (as measured along curb or roadway edge) by 96 inches deep (as measured from the curb or roadway edge). ADA Guidelines also state that a passing space of 60 inches is required for passing space adjacent to any sidewalk amenities.

Note: All bus shelters and bus stops in Fremont are serviced and operated by AC Transit. City staff and AC Transit work cooperatively in the installation of new bus facilities. AC Transit bus stop design guidelines can be viewed online at www.actransit.org .

Typical Fremont Bus Stop



Source: Improving Pedestrian Access to Transit: An Advocacy Handbook

Figure A-14
Accessible Bus Bulb Out

A.10. CROSSWALKS

A.10.1. Definition

The California Vehicle Code Section 275 defines a crosswalk as either:

(a) That portion of a roadway included within the prolongation or connection of the boundary lines of sidewalks at intersections where the intersecting roadways meet at approximately right angles, except the prolongation of such lines from an alley across a street.

(b) Any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface.

Notwithstanding the foregoing provisions of this section, there shall not be a crosswalk where local authorities have placed signs indicating no crossing.

At intersections, a crosswalk is effectively a legal extension of the sidewalk across the roadway. Crosswalks are present at all intersections, whether marked or unmarked, unless the pedestrian crossing is specifically prohibited by the local jurisdiction. At mid-block locations, crosswalks only exist if they are marked.

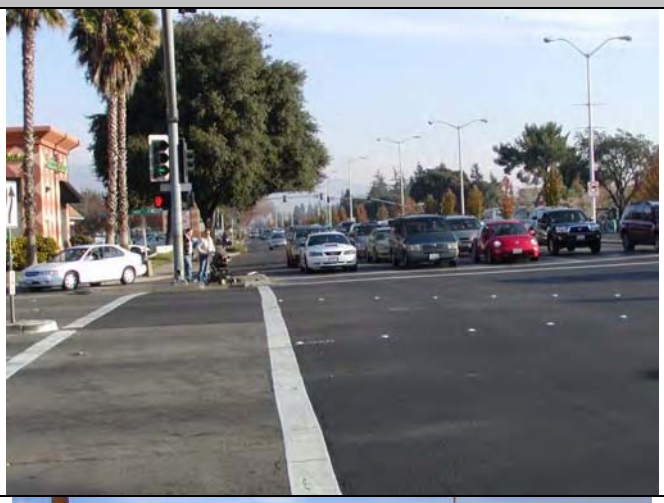
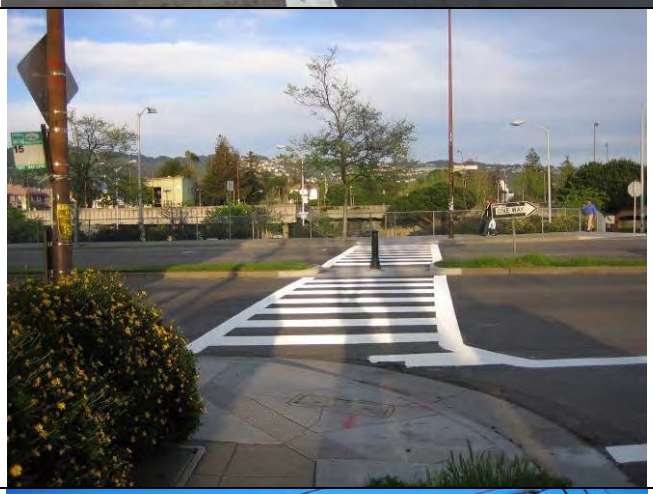
According to the California MUTCD, crosswalk markings provide guidance for pedestrians who are crossing roadways by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops. Crosswalk markings also serve to alert road users of a pedestrian crossing point across roadways not controlled by highway traffic signals or STOP signs. At non-intersection locations, crosswalk markings legally establish the crosswalk.

As noted in the FHWA report "Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations," the California MUTCD does not provide specific guidance relative to the site condition (e.g., traffic volume, pedestrian volume, number of lanes, presence or type of median) where marked crosswalks should or should not be used at uncontrolled locations. Nor does the MUTCD give specific guidance on the application of crosswalk enhancement features such as high-visibility striping, advanced warning signage, or flashing beacons. While the California MUTCD allows the use of these devices, decisions on their specific applicability to a given location have historically been left to the judgment of the local traffic engineers. This section summarizes the various types of crosswalk-related markings, signage and enhancement treatments available for use in the city of Fremont, discusses policies and procedures already in use for implementation of some of these devices, and provides more specific guidance and recommendations to assist city traffic engineers with future implementation.

A.10.2. Crosswalk Markings

Marked crosswalks serve to alert road users to expect crossing pedestrians and to direct pedestrians to desirable crossing locations. The City of Fremont utilizes two different marking styles for pedestrian crosswalks: the standard "transverse" style, consisting of two parallel lines; and the "ladder" style consisting of the two parallel lines with perpendicular ladder bars striped across the width of the crosswalk.

Table 3
Crosswalk Markings Used in Fremont

Style	Sample
Standard – Two solid white lines, 12 to 24 inches wide, spaced at least 6 feet apart (refer to CA MUTCD Sec. 3B.17). Also called "transverse."	
Ladder – Adds cross bar "rungs" to the standard crosswalk marking described above. Width of ladder lines should be 1 foot, with minimum spacing of ladder lines 1-5 feet.	
School Crosswalks. Crosswalks within the designated school zone must be painted yellow, per California MUTCD. Can be marked either standard or ladder. The school zone can be set a distance up to 500 feet from the school boundary.	

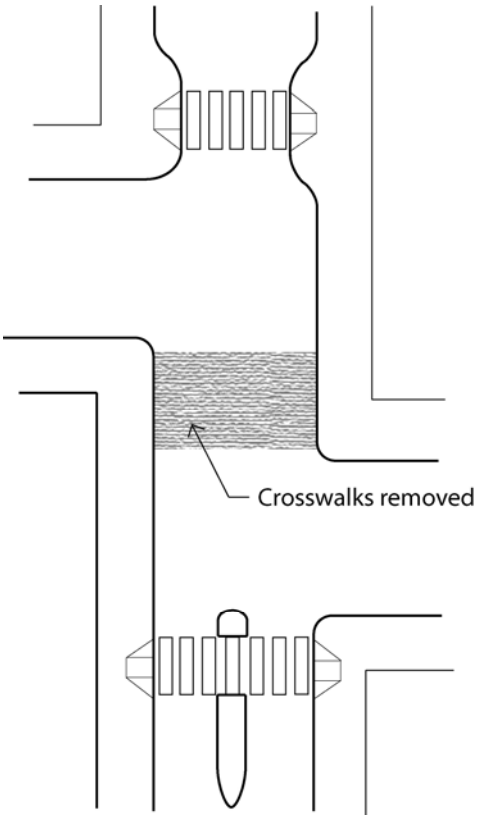
Crosswalks should extend across the full width of intersections, or to the edge of the intersecting crosswalk, to encourage pedestrians to cross perpendicular to the flow of traffic. Crosswalk markings can be can be applied with paint, thermoplastic, or reflective thermoplastic tape. At controlled crosswalk locations (STOP signs or traffic signals), crosswalk markings by themselves are considered sufficient treatment, given the presence of a traffic control to stop vehicles. At uncontrolled crosswalk locations (either uncontrolled intersections or mid-block locations), marked crosswalks can be enhanced with crosswalk signage, advance warning signage or flashing beacons -- these additional crosswalk enhancements are discussed in more detail below.

The decision on whether to install standard or ladder crosswalk markings depends upon a variety of factors such as the number of pedestrians crossing, traffic speeds/volumes, number of lanes to cross, presence of nearby schools or senior centers, and history of collisions. In general, standard transverse markings are considered appropriate at controlled intersections, minor uncontrolled intersections, and other crossing locations with low traffic volumes/speeds, short crossing distance, and good visibility. High visibility ladder markings are generally applied at uncontrolled or midblock locations, especially on major streets with high pedestrian volumes, heavy traffic volumes and speeds, and more than one lane each direction.

Crosswalk Striping at Major Intersections

Crosswalks should be striped with transverse lines at all controlled intersection legs, at minimum. At major intersections, where pedestrian activity is high or where significant pedestrian-vehicle conflicts occur or visibility of the crosswalk is a concern, ladder or zebra style crosswalks should be used.

Crosswalk Striping at "T" Intersections or Offset Intersections of Major Arterials and Residential Streets



Source: Portland Pedestrian Design Guide

Figure A-15
Offset Intersection

Fremont has many locations where major arterials intersect one or more minor residential streets on only one side, forming a "T" shaped intersection or a series of offset intersections. At locations where STOP or traffic signal controls are provided for each intersection leg, the provision of marked crosswalks should follow the guidelines for major intersections above. At locations where one or more intersection legs is uncontrolled, however, engineering judgment should be used in deciding whether or not to mark a crosswalk. Providing two marked crosswalks in close succession on an uncontrolled arterial roadway, for example, may reduce rather than enhance safety for pedestrians. In some locations, removing marked crosswalks on the inner portion of two offset intersection legs and enhancing the outer two marked crosswalks (through signage or traffic calming measure) may be the best solution, as shown in **Figure A-15**.

Wherever land uses adjacent to the major arterial of an offset or "T" intersection are expected to generate significant pedestrian traffic, at least one marked pedestrian crosswalk should be provided for each intersection. The decision to mark a crosswalk should be related to the presence of pedestrian-generating activity centers along a particular roadway; in some locations it is necessary to provide frequent marked pedestrian crosswalks, while in others it may be appropriate to space marked crosswalks further apart.

Crosswalk Striping at Minor Intersections

At minor intersections, the use of standard transverse lines to mark the crosswalk is generally appropriate. Crosswalks should be aligned with curb ramps such that wheelchair users do not need to leave the crosswalk to access the sidewalk on either side of the roadway. Crosswalks should only be marked at uncontrolled locations following an appropriate engineering study.

Crosswalk Markings in School Zones

To alert drivers to the presence of a school, crosswalks within the designated school zone must be striped yellow rather than white. A school zone can be designated up to 500' in advance of the school boundary. Special signage should also be located near school crossings in accordance with the guidelines provided in Chapter 7 of the California MUTCD. This document provide guidelines for enhancing crossings where one of the major concerns is the presence of school-aged children

A.10.3. Crosswalk Warning Signage and Pavement Markings

The California MUTCD provides guidance on the installation of warning signage and pavement stencils at and in advance of uncontrolled crosswalks. These signs are only for use at uncontrolled locations, because at STOP, YIELD, or signalized locations the presence of the traffic control serves to regulate the crosswalk at those intersections. Signage and stencils to supplement crosswalks are not required, and in fact the California MUTCD notes that such signs should be installed in locations where crossing activity is unexpected or not readily apparent.

W11-2

In advance of the crosswalk, the Pedestrian Crossing sign plate is installed (W11-2). At the crosswalk location itself, the Pedestrian Crossing sign plate plus a downward arrow is installed to show the exact location of the crosswalk. White "PED XING" pavement markings may be placed in each approach lane to a marked crosswalk, except at intersections controlled by traffic signals or STOP or YIELD signs.

S1-1

W16-7p

School Crosswalk Warning Assembly B (CA)

Special signage is required at and in advance of school crosswalks, also describe in the California MUTCD. Unlike the crosswalk warning signage for a normal (white) crosswalk, school crosswalk signage is mandatory. At each yellow school crosswalk, the School Crosswalk Warning Assembly B shall be installed, consisting of a School Warning plate (S1-1) plus downward arrow. In advance of each yellow school crossing, a School Advance Warning Assembly D shall be used, consisting of a school crossing plate plus "AHEAD." Yellow "SLOW SCHOOL XING" markings can be used in advance of uncontrolled school crosswalks, placed at least 100 feet in advance of the crosswalks.

A.10.4. High Visibility Signage

One way of increasing the visibility of pedestrian-related signage is through the use of a Fluorescent Yellow-Green (FYG) background. Use of this FYG signage is approved by the California MUTCD for use on pedestrian, bicycle and school signs. When the FYG background is used for corridor or school-area signing, a systematic approach should be used, so that the mixing of standard yellow and fluorescent yellow-green is avoided. The City of Fremont is currently installing FYG on a field review basis, it is recommended that the City of Fremont use FYG signs for all new pedestrian and school signage installations, and as old signs are replaced.

A.10.5. Stop and Yield Lines

The use of Stop Lines (commonly referred to as limit lines or stop bars) and Yield Lines is guided by California MUTCD Sec. 3B.16. Stop lines are solid white lines 12 inches to 24 inches wide that indicate where traffic must stop at STOP-controlled or signalized

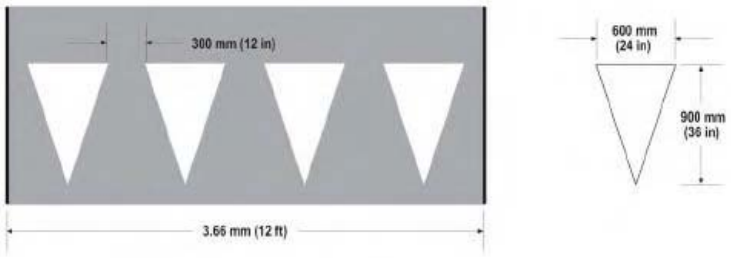


Figure A-16
Yield Line Specifications

locations. Stop lines are only required at controlled locations where no marked crosswalk exists; where a crosswalk is present, the crosswalk itself can function as the stop line. Jurisdictions are permitted by the MUTCD to install a stop line in advance of a marked crosswalk if they desire. Installing stop lines in advance of crosswalks can help to discourage vehicle encroachment into the marked crosswalk, particularly in right-turn-on-red situations where vehicles often creep forward to get better visibility. One solution to this problem is to stripe a stop line on the left lanes farther back than the right lanes, allowing better visibility to the left for right-turning vehicles. This also allows more clearance for vehicles turning from perpendicular streets. A supplement to Stop Lines is "STOP HERE ON RED" signage with a down arrow indicating the stop line as the proper location for vehicles to stop in advance of the intersection.

Yield lines (also called yield teeth or shark's teeth) indicate the point at which traffic should yield at uncontrolled locations, and are composed of white triangles 3 feet high by 2 feet wide, spaced 1 foot apart, as shown in Figure 11. In California, vehicles are required to "YIELD" to pedestrians in uncontrolled crosswalks, and yield lines can be used to indicate the appropriate location for vehicles to stop in advance of an uncontrolled crossing location. These markings are most effective in mid-block locations, where there is no intersection to give a motorist cues on the location to wait for a crossing pedestrian. The California MUTCD notes that yield line placement should be 20 to 50 feet back of uncontrolled mid-block intersections. On multi-lane roadways, yield lines can be used to counter the "multiple-threat" collision, which refers to the situation where a car in one lane stops and screens the pedestrian from the view of the adjacent lane. Installing yield lines 40-50 feet back (two car lengths) gives both pedestrians and motorists a better view of each other during the crossing. "YIELD HERE FOR PEDESTRIANS" signs with a down arrow can be used at the yield lines to indicate the proper location for vehicles to yield in advance of the crosswalk.

The City of Fremont currently does not install Stop Lines or Yield Lines at locations that have a marked crosswalk. It is recommended that the City consider installing stop lines at least 4 feet back from the crosswalk at locations that have a history of vehicle encroachment into the crosswalk or vehicles failing to stop for pedestrians on right-turn-on-red. At signalized mid-block pedestrian crosswalks, the city should install stop lines at least 40 feet in advance of the signal indication. Where applicable, at uncontrolled mid-block crosswalk locations the city should consider installation of yield lines at least 40 feet in advance of the crosswalk.

A.10.6. Pedestrian Warning Signage for Signalized Intersections

As noted under the discussion of crosswalk signs and markings, crosswalk warning signs are not permitted at crosswalks controlled by a traffic signal, as the traffic control itself serves to regulate vehicles at the intersection. At signalized intersections, particularly where right turn on red is permitted, installing stop lines as described above may be one way of reducing encroachment of vehicles into the pedestrian crosswalk. Another solution to remind drivers who are making turns to yield to pedestrians is installation of a "TURNING TRAFFIC MUST YIELD TO PEDESTRIANS" (R10-15) sign.

A.10.7. In-Street Yield to Pedestrian Signs

In-Street Yield to Pedestrian Signs are flexible plastic signs installed in the median to enhance a crosswalk at uncontrolled crossing locations. These signs communicate variations of the basic message 'State Law: Yield to Pedestrians'. The signs can be supplemented with a "SCHOOL" plate at the top for use at school crosswalks. If used near schools, these signs are

sometimes installed on a portable base and brought out in the morning and back in at the end of each day by school staff, which may reduce the chance that the sign will become less visible to motorists by being left out all the time. For permanently installed signs, maintenance can be an issue as the signs may be run over by vehicles and need to be replaced occasionally. Installing the signs in a raised median can help extend their lifetime.

A.10.8. Special Crosswalk Pavement Treatments

For aesthetic reasons, crosswalks are sometimes constructed with distinctive paving materials such as colored pavement or special decorative pavers meant to look like brick. Brick should never be used in crosswalks, as it tends to wear down quickly, becoming uneven and slippery and causing difficulties for pedestrians, especially persons with disabilities. Any use of unique materials or colored pavement should use concrete pavers or asphalt, and textures should maintain a smooth travel surface and good traction. It is important to note that these decorative pavement treatments do not enhance the visibility of the crosswalk location, in many cases make the crossing more difficult for persons with disabilities to navigate, make the crosswalk less visible to motorists at night, and for these reasons are not recommended. Regardless of any colored or unique pavement treatment used, marked crosswalk locations should always be marked with parallel transverse lines.

A.10.9. Pedestrian Signals

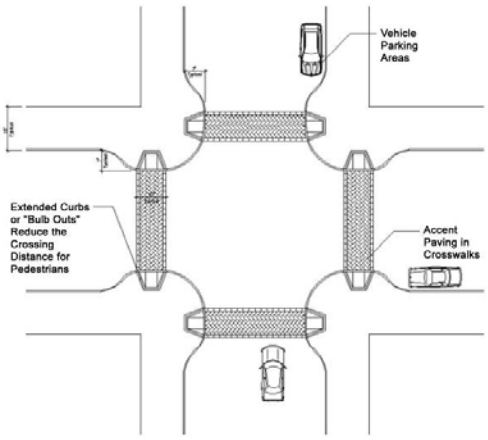
Traffic control signals minimize conflicts between motorists and pedestrians by giving clear direction about the proper use of the right-of-way. Section 4E of the California MUTCD outlines the standards for the use and design of pedestrian signals, including the warrants for locations where pedestrian signals may be provided. All new pedestrian signal installations shall consist of pedestrian signal head with international symbols, rather than textual "walk" and "don't walk" messages. Engineering judgment should be used in determining the specifics of pedestrian signal design at different crossing locations.

A.11. ENGINEERING TREATMENTS FOR CROSSWALKS

A.11.1. Curb Extensions

Curb extensions, also called "bulbouts" to describe their shape, are engineering improvements intended to reduce pedestrian crossing distance and increase visibility. Curb extensions can either be placed at corners or at mid-block crosswalk locations, and generally extend out about 6 feet to align with the edge of the parking lane. In addition to shortening the crosswalk distance, curb extensions serve to increase pedestrian visibility by allowing pedestrians to safely step out to the edge of the parking lane where they can see into the street, also making them more visible to oncoming drivers. At corners, curb extensions serve to reduce the turning radius, and provide space for perpendicularly-aligned curb ramps. Where bus stops are located, bulbouts can provide additional space for passenger queuing and loading.

Despite their advantages, curb extensions can require major re-engineering of the street and are not appropriate for all situations. Installing curb extensions where there are existing storm drain catch basins can require costly drainage modifications. Curb extensions may not be possible in some locations due to existing driveways or bus pull-out areas. Curb extensions need to be designed to avoid conflict with bicycle facilities, and should never extend into a bicycle lane.



Given their relatively high cost and challenges of implementation, curb extensions are not recommended as a tool for widespread implementation along every street in the city. Each potential curb extension location must be evaluated on a case-by-case basis, taking into account factors such as crossing volumes, parking lane widths, infrastructure challenges such as drainage or driveways, and locations of bus stops.

A.11.2. Median Refuge Islands

On wide, multi-lane roadways, pedestrians can benefit from median refuge islands, which offer a place to wait after crossing only half of the street. Refuge islands increase the visibility of pedestrian crossings, and decrease pedestrian collisions by reducing pedestrian/vehicle conflicts, motor vehicle speeds, and exposure time for pedestrians.[1] They also allow pedestrians to consider cross traffic from one direction at time, making it easier to find a gap and simplifying crossing.

The MUTCD defines an island as an area between traffic lanes for control of vehicular movements or for pedestrian refuge. Under the MUTCD definition, a refuge island can be delineated by curbs (raised), pavement markings (painted), or other devices. The MUTCD does not give any specific guidance on minimum dimensions of a refuge island

The FHWA document "Pedestrian Accommodations at Intersections" advises that a refuge island should be a minimum of 4 feet wide and 12 feet long (or the width of the crosswalk, whichever is greater).[2] The Metropolitan Transportation Commission's Pedestrian Toolkit states that refuge islands should be a minimum of 4 feet wide and 8 feet long.[3]

The ADA Access Board's Draft Guidelines on Accessible Public Rights of Way has a section on median islands.[4] These guidelines have not yet been adopted, and as such are not ADA requirements at this time. However, the guidelines are under consideration for adoption in the future, and cities may wish to look at these guidelines as best practices for compliance with future ADA standards.

The following right-of-way guidelines are recommended by the Access Board's Draft Guidelines[5]:

- Medians and pedestrian refuge islands in crosswalks shall contain a pedestrian access route, including passing space connecting to each crosswalk.
- Regarding a minimum width for refuge islands, the guidelines state that medians and pedestrian refuge islands shall be 1.8 m (6.0 ft) minimum in length in the direction of pedestrian travel.
- The guidelines permit both ramped up and cut-through design of refuge island, and advise that there are many factors to consider when deciding whether to ramp or cut-through a median or island. Those factors may include slope and cross slope of road, drainage, and width of median or island. They note that "curb ramps in medians and islands can add difficulty to the crossing for some users."

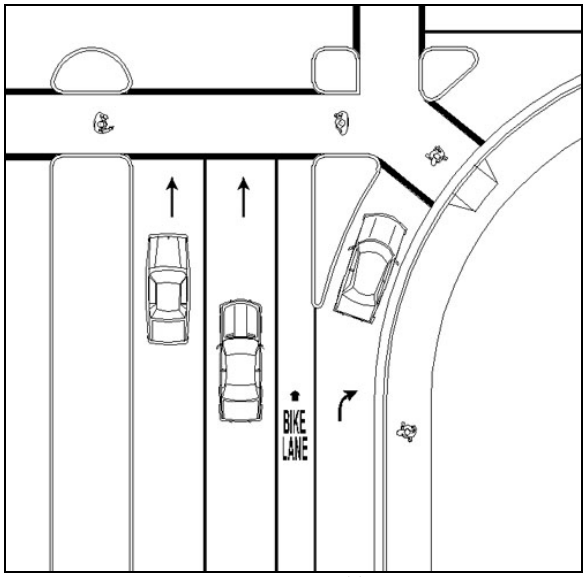
1 FHWA 2002b, p. 72
2 Pedestrian Accommodation and Intersections, FHWA, http://safety.fhwa.dot.gov/ped_bike/univcourse/swless15.htm
3 MTC Safety Toolbox http://www.mtc.ca.gov/planning/bicyclespedestrians/tools/pedRefugeIsland/index.htm
4 http://www.access-board.gov/PROWAC/draft.htm#305
5 Access Board, Draft Accessibility Guidelines for Public Rights of Way, Section R305.4

- Medians and refuge islands are also required to have detectable warnings, with detectable warnings at cut-through islands separated by a 2-foot minimum length of walkway without detectable warnings.

For pedestrian refuge islands at intersections, installing a median nose can help to provide additional protection for pedestrians. Median noses can also reduce vehicles encroaching into the refuge area when making left turns. However, median noses may not be feasible to install due to turning movement restrictions they can cause from side streets. Neither the MUTCD nor the ADA Access Board Guidelines have any requirement for median noses to be installed at intersection refuge islands. The City of Fremont should consider median nose installation on a case-by-case basis.

A.11.3. Channelized Right-Turn Slip Lanes

A right turn slip lane, often delineated by paint or a concrete island, separates the right turn movement from through and left-turning vehicles, as shown in Figure 14.



Source: Improving Pedestrian Access to Transit: An Advocacy Handbook

Figure A-17
Slip Turn Crossing Treatment

Slip turn lanes can be dangerous to pedestrians because drivers tend to concentrate on merging with oncoming traffic and may not see pedestrians entering the crosswalk. In high-traffic areas, inadequate gaps in right-turning traffic may exist, making crossing a slip turn lane difficult for pedestrians. The non-standard corner geometry introduced by slip lanes is extremely difficult for the blind to negotiate. Uncontrolled slip turn lanes should be discouraged where conflicts with pedestrians are anticipated.

The closing of a slip turn lane solves the problems discussed above and also serves to shorten the pedestrian crossing distance. Further, the area can be made an attractive corner for pedestrians through the use of street furniture, benches, and small-scale plantings. Where slip turns cannot be removed due to traffic capacity considerations, several options exist for enhancing pedestrian safety. Signalizing the right turn movement creates gaps for pedestrians and may be the safest alternative. Passive crossing treatments, such as warning signage, or a raised crosswalk connecting the sidewalk with a refuge island, may also improve conditions for pedestrians.

Slip turns should not be provided at intersections in which vehicles turn into a dedicated traffic lane. Because vehicles entering a dedicated lane do not have to yield to cross traffic, drivers tend to turn at higher speeds, making it difficult for pedestrians to cross safely.

A.11.4. Safety Barrels And Bollards

Safety barrels and bollards can be effective in preventing vehicles from entering the pedestrian right-of-way. They are also an inexpensive way to test more permanent intersection improvements such as curb bulbs. The placement of these vertical elements must ensure that they do not block the travel path of pedestrians, particularly those who are sight or mobility impaired. The creative use of bollards to create combination curb bulbs/bicycle parking areas can be effective in improving pedestrian safety while enhancing the aesthetic quality of an intersection and providing bicycle parking

A.11.5. Multi-Use Trail Intersections

Multi-use trails provide pedestrian and bicycle travel ways that are separated from automobile traffic. Trail crossings must be safe for pedestrians and bicyclists alike, and should also provide convenient connections to the City's street network. In general, trail crossings should be treated just like other intersection types, oriented at 90 degree angles whenever possible ensuring safety for all trail and road users. In addition to typical intersection lighting, signage, and traffic control features, trail crossings should include design features that warn both trail and roadway users of the crossing. Restricting parking near trail crossings, as at typical intersections, enhances sight distance.

A.12. TRAFFIC SIGNAL ENHANCEMENTS

This section discusses specific pedestrian enhancements for use at signalized intersection locations.

A.12.1. Countdown Pedestrian Signals

Countdown pedestrian signals provide information on the amount of time remaining in the pedestrian change interval, which can assist pedestrians in making safe crossing judgments. Guidance on the use of these devices is now included in the California MUTCD.

A.12.2. Signal Timing

Traffic signal timing can have an effect on the ability of slower-moving pedestrians to safely cross the street. The length of the pedestrian clearance phase is determined by calculating a clearance interval, which is the length of time it takes a person to walk from the curb on one side to the center of the farthest travel lane on the other. The standard walking speed used to calculate pedestrian clearance intervals recommended by the California MUTCD and used in Fremont, is 4 feet per second. However, where there are populations of pedestrians who walk more slowly, a lower walking speed should be considered in determining the pedestrian clearance time. Particularly where there are seniors or persons with disabilities, the MUTCD recommends a walking speed of 2.8 feet per second. This recommendation may also be applied to locations are elementary schools, as and young children commonly walk more slowly. Where signalized crossings are in close proximity to locations such as senior centers, senior housing, elementary schools, or centers generating significant volume of pedestrians with disabilities, the city of Fremont should consider utilizing a walking speed of 2.8 ft/sec to allow for longer crossing times.

A.12.3. Signal Activation

Traffic signals in Fremont operate in one of three ways:

Fixed-time signals have a regular cycle of phases with a fixed amount of green time for each movement. There is a regular WALK phase in each direction for each cycle, and pedestrians are not required to push a button to actuate the WALK phase.

Fully-actuated signals are highly responsive to local traffic variations because they detect vehicles and pedestrians as they arrive in the intersection on any approach. On fully-actuated signals, pedestrians are required to push the button to actuate the WALK phase in any direction.

Semi-actuated signals employ vehicle and pedestrian detection only on the side or local street. A green light and WALK phase is on for the major street unless the presence of a pedestrian or car is detected on the local street. Pedestrians must push a button to actuate the side street signal.

Special pedestrian phases can also be used to provide more crossing time for pedestrians at certain intersections. These include:

- Extended phase – At intersections with an extended phase, pedestrians who push the pedestrian crossing button get more time to cross the street than is provided during the normal signal phase.
- Leading Pedestrian Interval (LPI) – At intersections where there are conflicts between turning vehicles and pedestrians, pedestrians are given a "walk" designation a few seconds before the associated green phase for the intersection begins.

A.12.4. Pedestrian Pushbutton Detectors

Pedestrian pushbutton detectors allow for actuation of pedestrian signals, and should be located at all intersection corners where pedestrian actuation is used. As required by the California MUTCD, pedestrian pushbutton detectors must be accompanied by signs explaining their use. Pedestrian pushbutton detectors should be easily accessible for those in wheelchairs and for the sight-impaired, located approximately 3.5 ft. off the ground on a level surface. Pedestrian pushbuttons should not be used in locations where the pedestrian phase is set on a fixed cycle and cannot be actuated. One exception to this is the use of pushbuttons to activate audible pedestrian signals at non-actuated locations. More details on push button requirements are discussed in Section 12 on Accessibility.

Pedestrian Signal Actuation

There are several simple design considerations that greatly enhance the safety and comfort of pedestrians at signalized intersections:

- In areas with high pedestrian use (over 100 persons per hour), incorporate a pedestrian phase into the signal sequence instead of an on-demand signal phase,
- Place pedestrian push-buttons in locations that are easy to reach and ADA compliant, facing the sidewalk and clearly inline with the direction of travel (this will improve operations, as many pedestrians push all buttons to ensure that they hit the right one);
- Adjust the signal timing to accommodate the average walking speeds of anticipated intersection users (longer crossing times for intersections near schools and community centers, etc.), or to limit the time a pedestrian has to wait

Accessible Pedestrian Signals – Verbal/Vibrotactile Tone

- When verbal messages are used to communicate the pedestrian interval, they shall provide a clear message that the walk interval is in effect, as well as to which crossing it applies.
- The verbal message that is provided at regular intervals throughout the timing of the walk interval shall be the term "walk sign," which may be followed by the name of the street to be crossed.
- A verbal message is not required at times when the walk interval is not timing, but, if provided:
  1. It shall be the term "wait."
  2. It need not be repeated for the entire time that the walk interval is not timing.
- Accessible pedestrian signals that provide verbal messages may provide similar messages in languages other than English, if needed, except for the terms "walk sign" and "wait." A vibrotactile pedestrian device communicates information about pedestrian timing through a vibrating surface by touch.
- Vibrotactile pedestrian devices, where used, shall indicate that the walk interval is in effect, and for which direction it applies, through the use of a vibrating directional arrow or some other means.

A.13. CURB RAMPS

According to ADA regulations, all streets with sidewalks and curbs or other barriers must have curb ramps at intersections (U.S. Access Board 1999, p. 58) The City of Fremont requires curb ramp installation at all street intersections. New curb ramps must comply with the requirements of the State of California Code of Regulations Title 24 and the Americans with Disabilities Act Accessibility Guidelines.

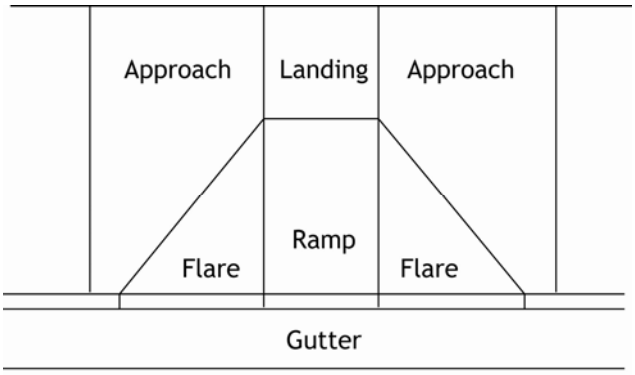


Figure A-18
Curb Ramp Components

Curb ramps should be oriented to direct pedestrians to the opposite corner and to provide a direct connection between the sidewalk through passage zone and the crosswalk. Curb ramps should be designed such that wheelchair users can transition from the sidewalk to the crosswalk without having to enter travel lanes. Diagonal corner curb ramps are sometimes an acceptable alternative for retrofits. However, signalized intersections on arterial streets should have one curb ramp per marked crosswalk at each corner.

Curb ramps consist of the following basic components, described in Table A-4 and depicted in **Figure A-18**.

Table A-4
Curb Ramp Components

Landing	The level area at the top of a curb ramp facing the ramp path. Landings allow wheelchairs to enter and exit a curb ramp, as well as travel along with sidewalk without tipping or tilting.
Approach	The portion of the sidewalk on either side of the landing. Approaches provide space for wheelchairs to prepare to enter landings.
Flare	The sloped transition between the curb and sidewalk. Flares provide a sloped transition between the sidewalk and curb ramp to help to prevent pedestrians from tripping over an abrupt change in level.
Ramp	The sloped transition between the sidewalk and street where the grade is constant and cross slope at a minimum. Ramps are the main pathway between the sidewalk and street.
Gutter	The trough that runs between the curb or curb ramp and the street, designed to serve as a conduit for storm water flow or other drainage.

Typical Diagonal Curb Ramp in Fremont

A.13.1. Recommended City Curb Ramp Guidelines

Curb ramps are necessary for people who use wheelchairs to access sidewalks and crosswalks. They help people with other mobility impairments to transition easily between sidewalks and crosswalks. Curb ramps also help people with strollers or rolling carts. ADA requires installation of curb ramps in new sidewalks, as well as retrofitting of existing sidewalks. The three most common curb ramp designs, perpendicular, parallel, and diagonal, and the situations in which each should be used, are described below. Other curb ramp types, including built-up ramps and depressed corners, are also addressed. Table A-4 provides a summary of accessible curb ramp design standards.

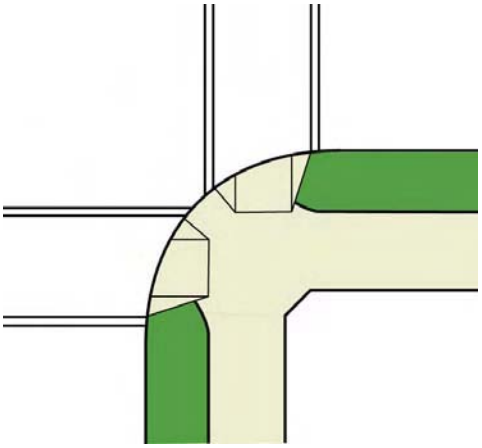


Figure A-19
Perpendicular Curb Ramp Design

Perpendicular Curb Ramps

Perpendicular curb ramps allow for a convenient, direct path of travel with a 90-degree angle to the curb. Perpendicular curb ramps are oriented such that users enter the street traveling perpendicular to vehicular traffic. Perpendicular curb ramps maximize access for pedestrians at intersections. They reduce the overall distance required to cross the street when compared with diagonal ramps. However, perpendicular curb ramps require more space than single diagonal ramps.

Perpendicular curb ramps without level landings are difficult for wheelchairs to negotiate, and should not be installed. Where sidewalks are narrow, there may not be space for two perpendicular curb ramps and their landings. Adding curb extensions can create additional space to accommodate two perpendicular ramps and landing areas. All newly constructed sidewalks should include two perpendicular ramps at each corner. Retrofitted ramps in multi-family neighborhoods and commercial areas should include perpendicular ramps, except where space is inadequate.

Diagonal Curb Ramps

Diagonal curb ramps are usually similar in design to perpendicular curb ramps, but are placed at the apex of the corner and oriented such that users enter the street traveling diagonally to the path of vehicle travel. Diagonal curb ramps require less space than dual perpendicular curb ramps, but also require users to take a longer, circuitous travel path to the other side than a perpendicular ramp. They cause the user to travel towards the center of the intersection before maneuvering left or right to cross the street. This is undesirable, particularly at locations with tight turning radii and no on-street parking, because users are exposed to turning vehicles at the base of the ramp. Being in the intersection longer exposes the user to greater risk of being hit by vehicles.

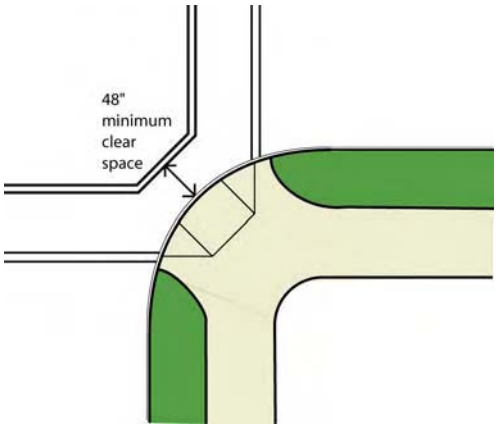
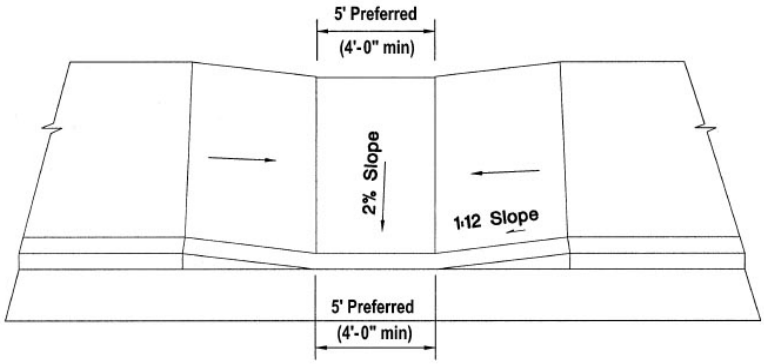


Figure A-20
Diagonal Curb Ramp Design

Diagonal curb ramps cost less than perpendicular ramps since they are single ramps, and hence the City can install more diagonal curb ramps than perpendicular curb ramps thereby speeding up retrofit programs. Diagonal curb ramps are generally desirable only on streets with little motor vehicle traffic where the advantage of installing more curb ramps compensates for the drawbacks, or in locations where perpendicular curb ramps cannot be accommodated due to space constraints.

Parallel Curb Ramps

Parallel curb ramps are two opposing ramps that slope down parallel to the direction of pedestrian travel.. They are generally used on narrow sidewalks where inadequate space exists to install other ramp types. Parallel curb ramps can be useful in location with high curbs, as the ramps can be extended to ensure a gentle ramp grade without concern for right-of-way limitations. However, parallel curb ramps require pedestrians who are continuing along the sidewalk to ramp down and up. Where space exists in a planting strip, parallel curb ramps can be designed in combination with perpendicular ramps to reduce the ramping for through pedestrians.



Source: Georgia Pedestrian Facilities Guidebook

Figure A-21 Parallel Curb Ramp Design

Depressed Corners

Depressed corners gradually lower the level of the sidewalk through a slope that meets the grade of the street. Depressed corners offer the same advantages of perpendicular curb ramps. However, they are generally not recommended since they make it difficult for people who are visually and cognitively

impaired to distinguish the transition from the sidewalk and street. They can confuse guide dogs as well. Turning motor vehicles, especially large trucks, may also intrude onto depressed corners. For these reasons, where depressed corners exist, they should be retrofitted with bollards or other intermittent barriers to prevent cars from traveling on the sidewalk. Detectable warnings should also be placed at the edge of the sidewalk.

Table A-5
Comparison of Minimum Curb Ramp Dimensions

Curb Ramp Type	Characteristic	ADAAG Standards	US Access Board Guidelines	Title 24 Standards	Other
Perpendicular Diagonal	Maximum slope of ramps	8.33%; if space prohibits this, 8.33% to 10% with a maximum rise of 150 mm (6 in); or 10% to 12.5% with a maximum rise of 75 mm (3 in)	7.1% + or – 1.2%		
	Maximum cross-slope of ramps	2%			
	Maximum slope of flared sides	10%			
	Minimum ramp width	0.915 m (36 in)	1.22 m (48 in)	1.22 m (48 in)	
	Minimum landing length	0.915 m (36 in); if landing is less than 1.22 m (48 in)			
	Minimum landing width		1.22 m (48 in)		
	Maximum gutter slope		5%		Gutter should be designed to not retain water
	Changes in level		flush		
	Truncated domes		610 mm (24 in)		
	Maximum slope of ramps	8.33%; if space prohibits this, 8.33% to 10% with a maximum rise of 150 mm (6 in); or 10% to 12.5% with a maximum rise of 75 mm (3 in)			
	Maximum cross-slope of ramps	2%			
	Maximum slope of flared sides	10%			
	Minimum ramp width	0.915 m (36 in)	1.22 m (48 in)	1.22 m (48 in)	
	Minimum landing length	0.915 m (36 in); if landing is less than 1.22 m (48 in)			
	Minimum landing width		1.22 m (48 in)		
	Maximum gutter slope		2%		Gutter should be designed to not retain water
	Changes in level		none		
	Minimum clear space		1.22 m (48 in)		
Parallel and combination	Maximum slope of ramps	8.33%; if space prohibits this, 8.33% to 10% with a maximum rise of 150 mm (6 in); or 10% to 12.5% with a maximum rise of 75 mm (3 in)	7.1%		
	Maximum cross-slope of ramps	2%			

Table A-5
Comparison of Minimum Curb Ramp Dimensions

Curb Ramp Type	Characteristic	ADAAG Standards	US Access Board Guidelines	Title 24 Standards	Other
	Maximum slope of flared sides	10%			
	Minimum ramp width	0.915 m (36 in)	1.22 m (48 in)	1.22 m (48 in)	
	Minimum landing length	0.915 m (36 in); if landing is less than 1.22 m (48 in)			
	Minimum landing width		1.22 m (48 in)		
	Maximum landing slope		2%		
	Maximum gutter slope		5%		Gutter should be designed to not retain water
	Changes in level		none		
	Truncated domes (parallel); detectable warnings (combination)		610 mm (24 in)		
Curb extensions and built-up curb ramps	Maximum slope of ramps	8.33%; if space prohibits this, 8.33% to 10% with a maximum rise of 150 mm (6 in); or 10% to 12.5% with a maximum rise of 75 mm (3 in)	7.1% + or – 1.2% (curb ext.); 7.1% (built-up)		
	Maximum cross-slope of ramps	2%	2% + or – 0.9% (curb ext.); 2% (built-up)		
	Maximum slope of flared sides	10%			
	Minimum ramp width	0.915 m (36 in)	1.22 m (48 in)	1.22 m (48 in)	
	Minimum landing length	0.915 m (36 in); if landing is less than 1.22 m (48 in)			
	Minimum landing width		1.22 m (48 in)		
	Maximum gutter slope		5%		Gutter should be designed to not retain water
	Changes in level		flush (curb ext.); none (built-up)		
	Detectable warnings		610 mm (24 in)		

A.14. RAISED SIDEWALKS

The purpose of these facilities is to eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street.

When implementing these measures:

- Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.
- Approaches to the raised crosswalk may be

designed to be similar to speed humps.

A.15. TURNING RADIUS

A corner's turning radius determines how fast a driver can comfortably make a turn. A tighter turn or shorter radius forces drivers to slow down allowing them to see pedestrians better and stop more quickly. Intersection corners with short radii increase safety for pedestrians at intersections by creating more sidewalk space and less roadway space. A decreased curb radius also allows for curb ramps that are aligned parallel to crosswalks. A 10' turning radius is recommended for streets without curbside parking. For streets with curbside parking, a 20' radius is recommended. Streets with significant volumes of truck traffic should be analyzed and may require larger corner radii.

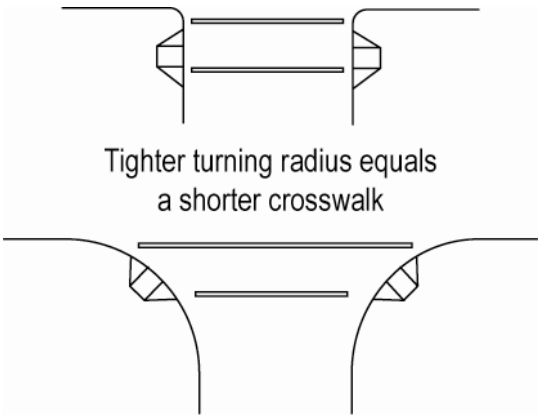


Figure A-22
Turning Radius

The arterial and collector roadway system in Fremont is designed to facilitate the flow of traffic throughout the City. Many roadway intersections in the city are designed using a wide turn or longer radius to allow vehicles to make the transition from one roadway to another without a substantial reduction in speed. The existing engineering standards used by the City should be adjusted as land development and local planning code will allow in order to provide a safer environment for pedestrians.

APPENDIX B: COST ESTIMATES

Appendix B-1

Sidewalk & Streetscape Improvement Cost Estimates

District	Improvement	Location	Cost Estimate	Reduce Curb Radii - Major (400 Square Feet Concrete, Remove 90' Curb/Gutter, Add 100' Curb/Gutter)	Crosswalk - High Visibility	Crosswalk - Transverse	Class I Path Construction	Concrete Sidewalk
				EA $24,000	EA $1,200	EA $500	LF $120	SF $9
Niles	Crosswalks	Mission Boulevard/Sullivan Underpass intersection improvements	**$121,500**	5		3		
Niles	Sidewalks	Mission Boulevard -Niles Depot to Sullivar Underpass intersection	**$142,560**					15840
Niles	Sidewalks	Mission Boulevard -Sullivan Underpass intersection to Niles Canyon Rd	**$191,160**					21240
Niles	Sidewalks	Nursery Avenue and Niles Boulevar	**$47,520**					5280
Centerville	Sidewalks	Peralta Boulevard - Camden Street to Parish Circle	**$114,048**					12672
Warm Springs	Sidewalks	Warm Springs Boulevard - S. Grimmer Blvd to Mission Blvd	**$684,288**					76032
Warm Springs	Sidewalks	Warm Springs Boulevard - Warren Ave to Pontiac Way	**$114,048**					12672
-	Sidewalks	Technology Drive - Auto Mall Parkway to Solar Way	**$170,424**					18936
Baylands	Sidewalks	Auto Mall Parkway - 880 Southbound off-ramp to 880 Southbound on-ramp	**$114,048**					12672
Ardenwood	Sidewalks	Decoto Road - Fremont Blvd to Armour Cl	**$28,512**					3168
Ardenwood	Sidwalks	Emilia Lane - Deep Creek Rd to Macbeth Ave	**$275,000**					1150
Warm Springs	Sidewalks	Warren Avenue - Navajo Road to Yakima Drive	**$378,000**					1742
Baylands	Sidewalks	S. Fremont Boulevard - 880 Southbound off ramp to 880 Northbound off-ramp	**$399,168**					44352
-	Sidewalks	Fremont Boulevard - Ferry St to Decoto Road	**$85,536**					9504
Ardenwood	Sidewalk	Fremont Boulevard - Decoto Road to Tamayo Street	**$430,000**					19008
Warm Springs	Sidewalks	Scott Creek Road - I-680 Southbound ramps to Green Valley Road	**$570,000**					2323
-	Sidewalks	Washington Boulevard - Meredith Ln to Luzon Dr	**$114,048**					12672
-	Sidewalks	Auto Mall Parkway - 680 Southbound off-ramp to 680 Southbound on-ramp	**$177,300**					19700
-	Sidewalks	Mission Boulevard (south side) - Driscol Road to Mission San Jose High School	**$200,000**					6000
Mission San Jose	Sidewalks	Cedar Street - Bryant Street to Ellsworth Street	**$200,000**					4435
Warm Springs	Sidewalks	Fourier Avenue - Westinghouse Dr to Warm Springs Blvd	**$59,940**					6660
Mission San Jose	Sidewalk	Mission Blvd. from Starr to Mission Creel	**$545,505**					800
-	Sidewalk	Nicolet Avenue/Alder Avenue, adjacent to Los Cerritos Community Park	**$217,000**					5520
Warm Springs	Class I Path	Hetch Hetchy Trail Extension - Scott Creek Road to E. Warren Way	**$1,583,160**				13193	
-	Class I Path	Farwell Path - Farwell Drive to Lemke Place	**$318,000**				2650	
-	Two Lane closures, refuge island modifications, crosswalk, bike lanes	Parkhurst Street/Walnut Avenue and Argonaut Way	**$400,000**		1			
Irvington	Class I Path/Sidewalk	Parkhurst Street/Walnut Avenue and Argonaut Way	**$200,000**				2323	
			$7,880,765					

Note: Unit Costs Exclude Contingencies (20%) & Engineering Costs

Appendix B-2

Signalized Intersection Cost Estimates

Cross Street 1	Cross Street 2	Cross Street 3	District	Tiers - Installation of Truncated Domes	Tiers - Signal Timing Modifications	Tiers - Installation of Perpendicular Ramps	Cost Estimate	Curb Ramp Retrofit (diagonal, per corner)	Curb Ramp Retrofit (Perpendicular, per corner)	Truncated Domes (retrofit plastic)	Ped Push Button	Signal Heads	Audible Signal Heads	Reduce Curb Radii - Major (400 Square Feet Concrete, Remove 80' Curb/Gutter, Add 100' Curb/Gutter)	Curb Extension - Major, with Drainage	Crosswalk - Transverse	Signs, Warning	Pedestrian Median Refuge Island	Bus Stop (Shelter, Bench, Curb Cut, Bus Pad)	Remove/Replace Signal Pole/Mast Arm
								EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
								$5,000	$5,000	$400	$1,200	$800	$800	$24,000	$36,000	$300	$300	$20,000	$40,000	$25,000
Albrae St	Balentine Dr	Stevenson Blvd	-				**$0**													
Alder Ave	Fremont Blvd		Centerville		1		**$0**													
Alvarado Blvd	Falcon Dr	Lake Arrowhead Ave	-	1			**$4,800**			12										
Alvarado Blvd	Great Salt Lake Dr	Merganser Dr	-	2			**$4,800**			12										
Alvarado Blvd	I-880 Sb Off Ramp		-				**$0**													
Alvarado Blvd	Lowry Rd		-	2			**$2,400**			6										
Amapola Dr	Driscoll Rd		-	3			**$1,600**			4										
Antelope Dr	Mission Blvd	S Grimmer Blvd	-	3		2	**$10,800**		2	2										
Anza St	Mission Blvd		Mission San Jose	1	1		**$8,000**			4			8							
Ardenwood Blvd	Ardenwood Ter		-				**$0**													
Ardenwood Blvd	Commerce Dr		-				**$3,200**			8										
Ardenwood Blvd	Kaiser Dr		-	2			**$22,400**			6								1		
Ardenwood Blvd	Paseo Padre Pkwy		-	1			**$4,800**			12										
Ardenwood Blvd	Route 84		-				**$0**			0										
Argonaut Way	Mowry Ave		-	3		2	**$11,600**		2	4										
Argonaut Way	Sacramento Ave		-	1			**$1,600**			4										
Auto Mall Pkwy	Boscell Rd		-	2			**$1,800**			3						2				
Auto Mall Pkwy	Christy St		-	2			**$4,000**			10										
Auto Mall Pkwy	Cushing Pkwy		-	1		1	**$8,600**		1	9										
Auto Mall Pkwy	Fremont Blvd		-	3		2	**$9,800**		1	12										
Auto Mall Pkwy	Grimmer Blvd	S Grimmer Blvd	-	3		2	**$6,400**			16										
Auto Mall Pkwy	I-680 Interchange		- Project Sheet	3			**$22,400**									8		1		
Auto Mall Pkwy	I-880 Nb Off Ramp		-	3			**$35,200**	6		10						4				
Auto Mall Pkwy	I-880 Sb Off Ramp		-	2			**$75,200**	10		10						4		1		
Auto Mall Pkwy	Osgood Rd		-	3		2	**$10,800**		2	2										
Auto Mall Pkwy	Pacific Commons Blvd		-	2			**$1,200**			3										
Auto Mall Pkwy	Technology Dr		-	3			**$2,000**			5										
Bart Way	Civic Center Dr		CBD				**$40,000**												1	
Bay St	Fremont Blvd	Union St	Centerville	1		1	**$90,400**		4	2			10		1		2			1
Bay St	Grimmer Blvd		Centerville	1			**$1,600**			4										
Bayside Pkwy	Gateway Blvd		-				**$0**													
Beacon Ave	Fremont Blvd		CBD	1			**$3,200**			8										
Besco Dr	Stevenson Blvd		-	3			**$21,400**	4		2						2				
Bidwell Dr	Fremont Blvd		CBD	2			**$1,200**			3										
Blacow Rd	Boone Dr		-	3			**$6,100**	1		2						1				
Blacow Rd	Calaveras Ave	Royal Palm Dr	-	3	1		**$3,200**			8										
Blacow Rd	Central Ave		-	3		2	**$6,400**			16										
Blacow Rd	Coco Palm Dr		-	3	1		**$13,100**	2		7						1				
Blacow Rd	Eggers Dr		-	3			**$22,600**	4		5						2				
Blacow Rd	Fremont Blvd		Centerville	1		1	**$26,400**		4	16										
Blacow Rd	Grimmer Blvd		Irvington	1		1	**$6,400**			16										
Blacow Rd	Hilo St		-	3	1		**$12,700**	2		6						1				
Blacow Rd	Mowry Ave		-	3		2	**$9,800**		1	12										
Blacow Rd	Omar St	Robin St	-	1			**$16,400**	3		2						2				
Blacow Rd	Osgood Rd		-	3		2	**$4,000**			10										
Blacow Rd	Sherwood St		Irvington	2			**$1,200**			3										
Blacow Rd	Stevenson Blvd		-	3		2	**$20,000**		4											
Blacow Rd	Thornton Ave		-	3		2	**$20,800**			2								1		
Bowling Green Cmn	Milton St	Paseo Padre Pkwy	-				**$48,000**							2						
Boyce Rd	Cherry St	Stevenson Blvd	-	2			**$4,000**			10										
Cabrillo Dr	Cabrillo Ter	Thornton Ave	-	3			**$1,600**			4										
Capitol Ave	Paseo Padre Pkwy		CBD				**$0**													
Carol Ave	Fremont Blvd		Irvington	2			**$1,600**			4										
Carol Ave	Grimmer Blvd		Irvington	2			**$6,500**	1		3						1				
Castro Ln	Driscoll Rd	Mission Blvd	-	3		2	**$75,000**		2	2	2	2				1				
Cedar Blvd	Stevenson Blvd		-				**$0**			0										
Central Ave	Dusterberry Way		Centerville	2		1	**$4,000**			10										
Central Ave	Farwell Dr		-	3			**$1,200**			3										
Central Ave	Fremont Blvd		Centerville	1		1	**$5,800**		1	2										
Central Ave	Glenmoor Dr		-	3		2	**$34,800**		2	2				1						
Central Ave	Logan Dr		Centerville	2			**$25,200**			3				1						

Appendix B-2

Signalized Intersection Cost Estimates

Cross Street 1	Cross Street 2	Cross Street 3	District	Tiers - Installation of Truncated Domes	Tiers - Signal Timing Modifications	Tiers - Installation of Perpendicular Ramps	Cost Estimate	Curb Ramp Retrofit (diagonal, per corner)	Curb Ramp Retrofit (Perpendicular, per corner)	Truncated Domes (retrofit plastic)	Ped Push Button	Signal Heads	Audible Signal Heads	Reduce Curb Radii - Major (400 Square Feet Concrete, Remove 80' Curb/Gutter, Add 100' Curb/Gutter)	Curb Extension - Major, with Drainage	Crosswalk - Transverse	Signs, Warning	Pedestrian Median Refuge Island	Bus Stop (Shelter, Bench, Curb Cut, Bus Pad)	Remove/Replace Signal Pole/Mast Arm
								EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
								$5,000	$5,000	$400	$1,200	$800	$800	$24,000	$36,000	$300	$300	$20,000	$40,000	$25,000
Chadbourne Dr	Paseo Padre Pkwy		-				**$0**													
Chapel Way	Fremont Blvd		Irvington	1			**$6,600**	1		4										
Chaucer Dr	Paseo Padre Pkwy	Whitehead Ln	-				**$48,000**							2						
Cherry Ln	Gallaudet Dr	Walnut Ave	CBD	1			**$8,000**			4			8							
Cherry Ln	Mowry Ave		CBD	1			**$1,600**			4										
Civic Center Dr	Mowry Ave		CBD	1			**$3,200**			8										
Civic Center Dr	Stevenson Blvd		CBD	1			**$9,200**			7			8							
Civic Center Dr	Walnut Ave		CBD	1			**$6,400**			16										
Contra Costa Ave	Coronado Dr	Thornton Ave	Centerville	2			**$30,400**			4			6	1						
Cougar Dr	Durham Rd	Mission Blvd	Mission San Jose	2		1	**$10,800**		2	2										
Country Dr	Fremont Blvd		Centerville	2			**$4,000**			10										
Country Dr	Paseo Padre Pkwy		Centerville				**$0**													
Cushing Pkwy	Auto Mall Cir		-	1			**$1,600**			4										
Cushing Pkwy	Bunche Dr		-	2		1	**$0**													
Cushing Pkwy	I-880 Sb On Ramp	S Fremont Blvd	-	2		1	**$0**													
Darwin Dr	Fremont Blvd		-	1			**$4,800**			12										
Davis St	Grimmer Blvd		Irvington	1			**$25,200**			3				1						
Davis St	Stevenson Blvd		-	3			**$16,400**	3		2						2				
Decoto Rd	Fremont Blvd		-	1		1	**$9,800**		1	12										
Decoto Rd	I-880 Nb Off Ramp		-				**$800**			2										
Decoto Rd	Ozark River Way		-	1			**$1,200**			3										
Decoto Rd	Paseo Padre Pkwy		-	2			**$2,800**			7										
Deep Creek Rd	Paseo Padre Pkwy		-	2			**$6,400**			16										
Delaware Dr	Fremont Blvd		-	3			**$1,600**			4										
Doane St	Grimmer Blvd	Yellowstone Park Dr	-	3			**$1,600**			4										
Dondero Way	San Pedro Dr	Thornton Ave	-	3	1		**$1,600**			4										
Driscoll Rd	Paseo Padre Pkwy		-	3			**$6,400**			16										
Dusterberry Way	Peralta Blvd		Centerville	2		1	**$3,200**			8										
Dusterberry Way	Thornton Ave		Centerville	2		1	**$57,000**		1	2			4	2						
E Warren Ave	Fernald St		Warm Springs	2	1		**$1,600**			4										
Eggers Dr	Fremont Blvd		Centerville	2			**$1,600**			4										
Eggers Dr	Paseo Padre Pkwy		Centerville				**$0**													
Enea Ct	Fremont Blvd		-	1			**$1,200**			3										
Enterprise St	S Grimmer Blvd	Technology Dr	-	3			**$1,600**			4										
Esparito Ave	Mission Blvd	Ondina Dr	-	3			**$1,600**			4										
Eugene St	Fremont Blvd		-	3			**$27,200**			8				1						
Farwell Dr	Mowry Ave		-	3			**$7,900**			9	2	2				1				
Farwell Dr	Omar St	Stevenson Blvd	-	3			**$9,300**	1		10						1				
Ferry Ln	Fremont Blvd		-	2			**$1,600**			4										
Fourier Ave	Lippert Ave	Warm Springs Blvd	Warm Springs	2	1		**$49,900**			4				2		1				
Fremont Blvd	Gateway Blvd		-	2			**$3,600**			9										
Fremont Blvd	Gibraltar Dr		-	3			**$1,200**			3										
Fremont Blvd	Hub Entrance		CBD	1			**$6,600**	1		4										
Fremont Blvd	Ice House Ter		-				**$800**			2										
Fremont Blvd	Industrial Pl		-	3			**$1,600**			4										
Fremont Blvd	Irvington Ave		Irvington	1		1	**$5,800**		1	2										
Fremont Blvd	Mission View Dr		-	3			**$2,400**			6										
Fremont Blvd	Mowry Ave		CBD	1		1	**$0**			0										
Fremont Blvd	N Grimmer Blvd		Irvington	2		1	**$5,600**			14										
Fremont Blvd	Nicolet Ave		-	3			**$3,600**			9										
Fremont Blvd	Paseo Padre Pkwy		-	1			**$6,400**			16										
Fremont Blvd	Peralta Ct		Centerville	1		1	**$10,800**		2	2										
Fremont Blvd	S Grimmer Blvd		-	3		2	**$6,400**			16										
Fremont Blvd	Stevenson Blvd		CBD	1		1	**$6,400**			16										
Fremont Blvd	Sundale Dr		CBD	2			**$2,800**			7										
Fremont Blvd	Tamayo St		-	3			**$4,000**			10										
Fremont Blvd	Thornton Ave		Centerville	1		1	**$1,600**			4										
Fremont Blvd	W Warren Ave		-	2		1	**$10,800**		2	2										
Fremont Blvd	Walnut Ave		CBD	1		1	**$6,400**			16										
Gable Dr	Warm Springs Blvd		Warm Springs	1			**$11,800**	2		3						2				
Gallaudet Dr	Stevenson Blvd		CBD	2			**$28,800**			4			4	1						
Gateway Blvd	Lakeview Blvd		-				**$0**													
Glenview Dr	Mowry Ave	Sutter Dr	-	3			**$11,400**	2		2						2				
Gomes Rd	Paseo Padre Pkwy		-				**$24,000**							1						
Grimmer Blvd	Valpey Park Ave		-	3			**$81,600**			4								4		

Appendix B-2

Signalized Intersection Cost Estimates

Cross Street 1	Cross Street 2	Cross Street 3	District	Tiers - Installation of Truncated Domes	Tiers - Signal Timing Modifications	Tiers - Installation of Perpendicular Ramps	Cost Estimate	Curb Ramp Retrofit (diagonal, per corner)	Curb Ramp Retrofit (Perpendicular, per corner)	Truncated Domes (retrofit plastic)	Ped Push Button	Signal Heads	Audible Signal Heads	Reduce Curb Radii - Major (400 Square Feet Concrete, Remove 80' Curb/Gutter, Add 100' Curb/Gutter)	Curb Extension - Major, with Drainage	Crosswalk - Transverse	Signs, Warning	Pedestrian Median Refuge Island	Bus Stop (Shelter, Bench, Curb Cut, Bus Pad)	Remove/Replace Signal Pole/Mast Arm
								EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
								$5,000	$5,000	$400	$1,200	$800	$800	$24,000	$36,000	$300	$300	$20,000	$40,000	$25,000
Guardino Dr	Mowry Ave		CBD	1			**$25,200**			3				1						
Guardino Dr	Stevenson Blvd		CBD	2			**$32,500**	1		6			6			1		1		
Guardino Dr	Walnut Ave		CBD	2			**$6,400**			4			6							
Hastings St	Mowry Ave		Centerville	2			**$6,400**			16										
Hunter Ln	Mission Blvd		Mission San Jose	2			**$25,600**			4				1						
I-680	Luzon Dr	Washington Blvd	-	3			**$25,200**			3				1						
I-680 Sb On & 0Ff Ramp	Mission Blvd		Warm Springs	3		1	**$20,300**		3	3		4				3				
I-880 Nb Off Ramp	Mowry Ave		-	3			**$6,100**	1		2						1				
I-880 Nb Off Ramp	S Fremont Blvd		-	3			**$1,100**			2						1				
I-880 Nb On & Off Ramp	N Fremont Blvd		-				**$0**													
I-880 Nb Ramp	Stevenson Blvd		-	3			**$20,600**	4								2				
I-880 Sb Off Ramp	S Fremont Blvd		-	1			**$20,600**	4								2				
I-880 Sb Ramp	Stevenson Blvd		-				**$10,300**	2								1				
Isherwood Way	Paseo Padre Pkwy		-				**$0**													
Kato Rd	Milmont Dr		-	3			**$1,600**			4										
Kato Rd	Scott Creek Rd	Warm Springs Blvd	Warm Springs	2		1	**$6,400**			16										
Kato Rd	Warrem Ave		-	3		2	**$5,600**			14										
King Ave	Mission Blvd		Niles	2			**$1,600**			4										
Las Palmas Ave	Mission Blvd		-	3			**$25,600**			4				1						
Leslie St	Stevenson Blvd	Stevenson Cmn	CBD	2			**$4,800**			4			4							
Liberty St	Stevenson Blvd		CBD	1			**$6,000**			3			6							
Liberty St	Walnut Ave		CBD	1			**$11,200**			16			6							
Logan Dr	Mowry Ave		-	3			**$11,400**	2		2						2				
Lopes Ct	Old Warm Springs Blvd	S Grimmer Blvd	-	3			**$4,800**			12										
Mayten Way	Warm Springs Blvd	Whitney Pl	Warm Springs	2			**$1,600**			4										
Mission Blvd	Mission Cielo Ave	Palm Ave	-	3			**$73,600**			4				3						
Mission Blvd	Mohave Dr		Warm Springs	1			**$1,600**			4										
Mission Blvd	Morrison Canyon Rd	Walnut Ave	-	3		2	**$10,800**		2	2										
Mission Blvd	Mowry Ave		-	3		2	**$3,600**			9										
Mission Blvd	Niles Blvd	Niles Canyon Rd	Niles	1		1	**$16,600**		3	4										
Mission Blvd	Paseo Padre Pkwy		-	3			**$81,600**			4								4		
Mission Blvd	Pickering Ave	W Pickering Ave	-	3			**$1,600**			4										
Mission Blvd	Pine St		Mission San Jose	1			**$75,000**			4			6			1				
Mission Blvd	Route 238	Warm Springs Blvd	Warm Springs	1		1	**$4,000**			10										
Mission Blvd	Stanford Ave		-	3			**$26,500**	1		3						1		1		
Mission Blvd	Stevenson Blvd		-	3		2	**$9,000**		1	2			4							
Mission Blvd	Washington Blvd		Mission San Jose	1		1	**$15,600**		2	2			6							
Mission Ct	Warm Springs Blvd		Warm Springs	1			**$2,400**			6										
Mission View Dr	Paseo Padre Pkwy		-	1	1		**$10,100**	1					6			1				
Moraine St	Thornton Ave		Centerville	2			**$1,600**			4										
Mowry Ave	Parkside Dr		Centerville	1			**$1,600**			4										
Mowry Ave	Paseo Padre Pkwy		CBD	1			**$5,200**			13										
Mowry Ave	Peralta Blvd		Centerville	2		1	**$16,500**	3		3						1				
Mowry Ave	State St		Centerville	1			**$3,200**			8										
N Grimmer Blvd	Paseo Padre Pkwy		Irvington	2			**$5,600**			6			4							
Niles Blvd	Nursery Ave		Niles	2			**$1,200**			3										
Nursery Ave	Mission Blvd		Niles	2			**$35,200**	2		3				1						
Orchard Dr	Mission Blvd		-	3			**$1,200**			3										
Osgood Rd	S Grimmer Blvd	Warm Springs Blvd	Warm Springs	2		1	**$6,600**		1	4										
Osgood Rd	Washington Blvd		-	3		2	**$7,800**		1	7										
Paseo Padre Pkwy	Durham Rd		-	2			**$49,600**			4				2						
Paseo Padre Pkwy	Peralta Blvd		Centerville	2			**$4,000**			10										
Paseo Padre Pkwy	Princetown Plaza	Raleys	CBD				**$0**													
Paseo Padre Pkwy	Sequoia Rd		Centerville				**$0**													
Paseo Padre Pkwy	Siward Dr		-				**$0**													
Paseo Padre Pkwy	Stevenson Blvd		CBD	1			**$11,600**			13			8							
Paseo Padre Pkwy	Thornton Ave		Centerville	2			**$2,400**			6										
Paseo Padre Pkwy	Walnut Ave		CBD	1			**$6,400**			16										
Paseo Padre Pkwy	Warwick Rd		-		1		**$0**													
Paseo Padre Pkwy	Washington Blvd		Mission San Jose	2			**$1,600**			4										
Roberts Ave	Washington Blvd		Irvington	1			**$4,000**			10										
Sailway Dr	Paseo Padre Pkwy		-	1	1		**$4,800**						6							
Stevenson Blvd	Sundale Dr		-	3			**$35,400**	2		2				1		2				
Tonopah Dr	Warm Springs Blvd		Warm Springs	2			**$1,600**			4										
Warm Springs Blvd	Warren Ave		Warm Springs	1		1	**$6,400**			16										

Appendix B-2

Signalized Intersection Cost Estimates

Cross Street 1	Cross Street 2	Cross Street 3	District	Tiers - Installation of Truncated Domes	Tiers - Signal Timing Modifications	Tiers - Installation of Perpendicular Ramps	Cost Estimate	Curb Ramp Retrofit (diagonal, per corner)	Curb Ramp Retrofit (Perpendicular, per corner)	Truncated Domes (retrofit plastic)	Ped Push Button	Signal Heads	Audible Signal Heads	Reduce Curb Radii - Major (400 Square Feet Concrete, Remove 80' Curb/Gutter, Add 100' Curb/Gutter)	Curb Extension - Major, with Drainage	Crosswalk - Transverse	Signs, Warning	Pedestrian Median Refuge Island	Bus Stop (Shelter, Bench, Curb Cut, Bus Pad)	Remove/Replace Signal Pole/Mast Arm
								EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
								$5,000	$5,000	$400	$1,200	$800	$800	$24,000	$36,000	$300	$300	$20,000	$40,000	$25,000
							$2,230,900													
	Note: Unit Costs Exclude Contingencies (20%) & Engineering Costs																			

Appendix B-3

Installation of Truncated Domes at Arterial and Arterial/Collector Intersections Tier 1			
Cross Street 1	**Cross Street 2**	**Cross Street 3**	**District**
Alvarado Blvd	Falcon Dr	Lake Arrowhead Ave	Ardenwood
Anza St	Mission Blvd		Mission San Jose
Ardenwood Blvd	Paseo Padre Pkwy		Ardenwood
Argonaut Way	Sacramento Ave		-
Auto Mall Pkwy	Cushing Pkwy		Baylands
Bay St	Fremont Blvd	Union St	Irvington
Bay St	Grimmer Blvd		Irvington
Beacon Ave	Fremont Blvd		CBD
Blacow Rd	Omar St	Robin St	-
Blacow Rd	Grimmer Blvd		Irvington
Blacow Rd	Fremont Blvd		Irvington
Central Ave	Fremont Blvd		Centerville
Chapel Way	Fremont Blvd		Irvington
Cherry Ln	Gallaudet Dr	Walnut Ave	CBD
Cherry Ln	Mowry Ave		CBD
Civic Center Dr	Walnut Ave		CBD
Civic Center Dr	Mowry Ave		CBD
Civic Center Dr	Stevenson Blvd		CBD
Cushing Pkwy	Auto Mall Cir		Baylands
Darwin Dr	Fremont Blvd		Ardenwood
Davis St	Grimmer Blvd		Irvington
Decoto Rd	Fremont Blvd		Ardenwood
Decoto Rd	Ozark River Way		Ardenwood
Enea Ct	Fremont Blvd		Ardenwood
Fremont Blvd	Walnut Ave		CBD
Fremont Blvd	Mowry Ave		Centerville
Fremont Blvd	Stevenson Blvd		CBD
Fremont Blvd	Paseo Padre Pkwy		Ardenwood
Fremont Blvd	Irvington Ave		Irvington
Fremont Blvd	Thornton Ave		Centerville
Fremont Blvd	Peralta Ct		Centerville
Fremont Blvd	Hub Entrance		CBD
Gable Dr	Warm Springs Blvd		Warm Springs
Guardino Dr	Mowry Ave		CBD
I-880 Sb Off Ramp	S Fremont Blvd		Baylands
Liberty St	Walnut Ave		CBD
Liberty St	Stevenson Blvd		CBD
Mission Blvd	Washington Blvd		Mission San Jose
Mission Blvd	Pine St		Mission San Jose
Mission Blvd	Mohave Dr		Warm Springs
Mission Blvd	Route 238	Warm Springs Blvd	Warm Springs
Mission Blvd	Niles Blvd	Niles Canyon Rd	Niles
Mission Ct	Warm Springs Blvd		Warm Springs
Mission View Dr	Paseo Padre Pkwy		-
Mowry Ave	State St		CBD
Mowry Ave	Paseo Padre Pkwy		CBD
Mowry Ave	Parkside Dr		CBD
Paseo Padre Pkwy	Walnut Ave		CBD
Paseo Padre Pkwy	Stevenson Blvd		CBD
Roberts Ave	Washington Blvd		Irvington
Sailway Dr	Paseo Padre Pkwy		-
Warm Springs Blvd	Warren Ave		Warm Springs

Appendix B-3

Installation of Truncated Domes at Arterial and Arterial/Collector Intersections Tier 2			
Alvarado Blvd	Great Salt Lake Dr	Merganser Dr	Ardenwood
Alvarado Blvd	Lowry Rd		Ardenwood
Ardenwood Blvd	Kaiser Dr		Ardenwood
Ardenwood Blvd	Commerce Dr		Ardenwood
Auto Mall Pkwy	Christy St		Baylands
Auto Mall Pkwy	Boscell Rd		Baylands
Auto Mall Pkwy	Pacific Commons Blvd		Baylands
Auto Mall Pkwy	I-880 Sb Off Ramp		Baylands
Bidwell Dr	Fremont Blvd		CBD
Blacow Rd	Sherwood St		Irvington
Boyce Rd	Cherry St	Stevenson Blvd	Baylands
Cabrillo Dr	Canal Ter	Decoto Rd	Ardenwood
Carol Ave	Fremont Blvd		Irvington
Carol Ave	Grimmer Blvd		Irvington
Central Ave	Dusterberry Way		Centerville
Central Ave	Logan Dr		Centerville
Contra Costa Ave	Coronado Dr	Thornton Ave	Centerville
Cougar Dr	Durham Rd	Mission Blvd	Mission San Jose
Country Dr	Fremont Blvd		Centerville
Cushing Pkwy	Bunche Dr		Baylands
Cushing Pkwy	Northport Loop		Baylands
Cushing Pkwy	I-880 Sb On Ramp	S Fremont Blvd	Baylands
Decoto Rd	Paseo Padre Pkwy		Ardenwood
Deep Creek Rd	Paseo Padre Pkwy		Ardenwood
Dusterberry Way	Peralta Blvd		Centerville
Dusterberry Way	Thornton Ave		Centerville
E Warren Ave	Fernald St		Warm Springs
Eggers Dr	Fremont Blvd		Centerville
Ferry Ln	Fremont Blvd		Ardenwood
Fourier Ave	Lippert Ave	Warm Springs Blvd	Warm Springs
Fremont Blvd	Sundale Dr		CBD
Fremont Blvd	W Warren Ave		Baylands
Fremont Blvd	N Grimmer Blvd		Irvington
Fremont Blvd	Gateway Blvd		Baylands
Gallaudet Dr	Stevenson Blvd		CBD
Guardino Dr	Stevenson Blvd		CBD
Guardino Dr	Walnut Ave		CBD
Hastings St	Mowry Ave		Centerville
Hunter Ln	Mission Blvd		Mission San Jose
I-680 Nb On & Off Ramp	Mission Blvd	Mission Pass Rd	Mission San Jose
Kato Rd	Scott Creek Rd	Warm Springs Blvd	Warm Springs
King Ave	Mission Blvd		Niles
Leslie St	Stevenson Blvd	Stevenson Cmn	CBD
Mayten Way	Warm Springs Blvd	Whitney Pl	Warm Springs
Moraine St	Thornton Ave		Centerville
Mowry Ave	Peralta Blvd		Centerville
N Grimmer Blvd	Paseo Padre Pkwy		Irvington
Niles Blvd	Nursery Ave		Niles
Nursery Ave	Mission Blvd		Niles
Osgood Rd	S Grimmer Blvd	Warm Springs Blvd	Warm Springs
Paseo Padre Pkwy	Thornton Ave		Centerville
Paseo Padre Pkwy	Washington Blvd		Mission San Jose
Paseo Padre Pkwy	Durham Rd		Mission San Jose
Paseo Padre Pkwy	Peralta Blvd		Centerville
Thornton Ave	Post St		Centerville
Tonopah Dr	Warm Springs Blvd		Warm Springs
I-680 Nb On & Off Ramp	Mission Blvd		Warm Springs

Appendix B-3

Installation of Truncated Domes at Arterial and Arterial/Collector Intersections			
Tier 3			
Amapola Dr	Driscoll Rd		-
Antelope Dr	Mission Blvd	S Grimmer Blvd	-
Argonaut Way	Mowry Ave		-
Auto Mall Pkwy	Grimmer Blvd	S Grimmer Blvd	-
Auto Mall Pkwy	Technology Dr		-
Auto Mall Pkwy	Fremont Blvd		-
Auto Mall Pkwy	Osgood Rd		-
Auto Mall Pkwy	I-880 Nb Off Ramp		-
Auto Mall Pkwy	I-680 Sb Off Ramp		-
Besco Dr	Stevenson Blvd		-
Blacow Rd	Calaveras Ave	Royal Palm Dr	-
Blacow Rd	Mowry Ave		-
Blacow Rd	Central Ave		-
Blacow Rd	Coco Palm Dr		-
Blacow Rd	Hilo St		-
Blacow Rd	Stevenson Blvd		-
Blacow Rd	Eggers Dr		-
Blacow Rd	Boone Dr		-
Blacow Rd	Osgood Rd		-
Blacow Rd	Thornton Ave		-
Cabrillo Dr	Cabrillo Ter	Thornton Ave	-
Castro Ln	Driscoll Rd	Mission Blvd	-
Central Ave	Glenmoor Dr		-
Central Ave	Farwell Dr		-
Davis St	Stevenson Blvd		-
Delaware Dr	Fremont Blvd		-
Doane St	Grimmer Blvd	Yellowstone Park Dr	-
Dondero Way	San Pedro Dr	Thornton Ave	-
Driscoll Rd	Paseo Padre Pkwy		-
Durham Rd	I-680 Nb Off Ramp	Sabercat Rd	-
Enterprise St	S Grimmer Blvd	Technology Dr	-
Esparito Ave	Mission Blvd	Ondina Dr	-
Eugene St	Fremont Blvd		-
Farwell Dr	Omar St	Stevenson Blvd	-
Farwell Dr	Mowry Ave		-
Fremont Blvd	Mission View Dr		-
Fremont Blvd	Tamayo St		-
Fremont Blvd	Nicolet Ave		-
Fremont Blvd	S Grimmer Blvd		-
Fremont Blvd	Industrial Pl		-
Fremont Blvd	Gibraltar Dr		-
Glenview Dr	Mowry Ave	Sutter Dr	-
Grimmer Blvd	Valpey Park Ave		-
I-680	Luzon Dr	Washington Blvd	-
I-680 Nb On Ramp	Washington Blvd		-
I-680 Sb On & 0Ff Ramp	Mission Blvd		-
I-880 Nb Off Ramp	Mowry Ave		-
I-880 Nb Off Ramp	S Fremont Blvd		-
I-880 Nb Ramp	Stevenson Blvd		-
Kato Rd	Milmont Dr		-
Kato Rd	Warrem Ave		-
Las Palmas Ave	Mission Blvd		-
Logan Dr	Mowry Ave		-
Lopes Ct	Old Warm Springs Blvd	S Grimmer Blvd	-
Mission Blvd	Paseo Padre Pkwy		-
Mission Blvd	Stanford Ave		-
Mission Blvd	Morrison Canyon Rd	Walnut Ave	-
Mission Blvd	Pickering Ave	W Pickering Ave	-
Mission Blvd	Mission Cielo Ave	Palm Ave	-
Mission Blvd	Stevenson Blvd		-
Mission Blvd	Mowry Ave		-
Orchard Dr	Mission Blvd		-
Osgood Rd	Washington Blvd		-
Osgood Rd	Skyway Ct		-
Stevenson Blvd	Sundale Dr		-
Washington Blvd	Meredith Dr		-
Tier 4			
*Arterials at unsignalized intersections			

Appendix B-4

Installation of Perpendicular Ramps at Arterial/Arterial Intersections Tier 1			
Cross Street 1	**Cross Street 2**	**Cross Street 3**	**District**
Auto Mall Pkwy	Cushing Pkwy		Baylands
Bay St	Fremont Blvd	Union St	Irvington
Blacow Rd	Grimmer Blvd		Irvington
Blacow Rd	Fremont Blvd		Irvington
Central Ave	Dusterberry Way		Centerville
Central Ave	Fremont Blvd		Centerville
Cougar Dr	Durham Rd	Mission Blvd	Mission San Jose
Cushing Pkwy	Bunche Dr		Baylands
Cushing Pkwy	I-880 Sb On Ramp	S Fremont Blvd	Baylands
Decoto Rd	Fremont Blvd		Ardenwood
Dusterberry Way	Peralta Blvd		Centerville
Dusterberry Way	Thornton Ave		Centerville
Fremont Blvd	Walnut Ave		CBD
Fremont Blvd	Mowry Ave		CBD
Fremont Blvd	Stevenson Blvd		CBD
Fremont Blvd	W Warren Ave		Baylands
Fremont Blvd	Irvington Ave		Irvington
Fremont Blvd	N Grimmer Blvd		Irvington
Fremont Blvd	Thornton Ave		Centerville
Fremont Blvd	Peralta Ct		Centerville
Kato Rd	Scott Creek Rd	Warm Springs Blvd	Warm Springs
Mission Blvd	Washington Blvd		Mission San Jose
Mission Blvd	Route 238	Warm Springs Blvd	Warm Springs
Mission Blvd	Niles Blvd	Niles Canyon Rd	Niles
Mowry Ave	Peralta Blvd		Centerville
Osgood Rd	S Grimmer Blvd	Warm Springs Blvd	Warm Springs
Warm Springs Blvd	Warren Ave		Warm Springs
I-680 Nb On & Off Ramp	Mission Blvd		Warm Springs
Tier 2			
Cross Street 1	**Cross Street 2**	**Cross Street 3**	**District**
Antelope Dr	Mission Blvd	S Grimmer Blvd	-
Argonaut Way	Mowry Ave		-
Auto Mall Pkwy	Grimmer Blvd	S Grimmer Blvd	-
Auto Mall Pkwy	Fremont Blvd		-
Auto Mall Pkwy	Osgood Rd		-
Blacow Rd	Mowry Ave		-
Blacow Rd	Central Ave		-
Blacow Rd	Stevenson Blvd		-
Blacow Rd	Osgood Rd		-
Blacow Rd	Thornton Ave		-
Castro Ln	Driscoll Rd	Mission Blvd	-
Central Ave	Glenmoor Dr		-
Fremont Blvd	S Grimmer Blvd		-
Kato Rd	Warrem Ave		-
Mission Blvd	Morrison Canyon Rd	Walnut Ave	-
Mission Blvd	Stevenson Blvd		-
Mission Blvd	Mowry Ave		-
Osgood Rd	Washington Blvd		-

Appendix B-5

Signalized Intersection - Signal Timing Adjustment Tier 1			
Cross Street 1	**Cross Street 2**	**Cross Street 3**	**District**
Alder Ave	Fremont Blvd		Centerville
Anza St	Mission Blvd		Mission San Jose
Blacow Rd	Calaveras Ave	Royal Palm Dr	-
Blacow Rd	Coco Palm Dr		-
Blacow Rd	Hilo St		-
Dondero Way	San Pedro Dr	Thornton Ave	-
E Warren Ave	Fernald St		Warm Springs
Fourier Ave	Lippert Ave	Warm Springs Blvd	Warm Springs
Mission View Dr	Paseo Padre Pkwy		-
Paseo Padre Pkwy	Warwick Rd		-
Sailway Dr	Paseo Padre Pkwy		-

Appendix B-6

Installation of Audible Signals Tier 1			
Cross Street 1	**Cross Street 2**	**Cross Street 3**	**District**
Anza St	Mission Blvd		Mission San Jose
Bay St	Fremont Blvd	Union St	Irvington
Cherry Ln	Gallaudet Dr	Walnut Ave	CBD
Civic Center Dr	Stevenson Blvd		CBD
Gallaudet Dr	Stevenson Blvd		CBD
Guardino Dr	Stevenson Blvd		CBD
Guardino Dr	Walnut Ave		CBD
Leslie St	Stevenson Blvd	Stevenson Cmn	CBD
Liberty St	Stevenson Blvd		CBD
Mission Blvd	Washington Blvd		Mission San Jose
Mission Blvd	Pine St		Mission San Jose
Mission Blvd	Morrison Canyon Rd	Walnut Ave	-
Mission Blvd	Stevenson Blvd		-
Mission View Dr	Paseo Padre Pkwy		-
Mowry Ave	Peralta Blvd		Centerville
N Grimmer Blvd	Paseo Padre Pkwy		Irvington
Paseo Padre Pkwy	Stevenson Blvd		CBD
Sailway Dr	Paseo Padre Pkwy		-

Appendix B-7

Unsignalized Intersection Cost Estimates

Cross Street 1	Cross Street 2	Cross Street 3	Cost Estimate	Curb Ramp Retrofit (Perpendicular, per corner)	Truncated Domes (retrofit plastic)	Reduce Curb Radii - Major (450 Square Feet Concrete, Remove 95' Curb/Gutter, Add 105' Curb/Gutter)	Curb Extension - Major, with Drainage/Inlets	Crosswalk - High Visibility	Crosswalk - Transverse	Pedestrian Median Refuge Island	Bus Stop (Shelter, Bench, Curb Cut, Bus Pad)
				EA	EA	EA	EA	EA	EA	EA	EA
				$5,000	$400	$24,000	$36,000	$1,200	$500	$20,000	$40,000
Fremont Blvd	Clough Ave	Driveway	**$25,200**		3	1					
Fremont Blvd	Bonde Wy		**$45,200**		4			3			1
Mission Blvd	Anza St	Anza Pine Rd	**$92,800**		2		2			1	
Alder Ave	Fremont Blvd		**$2,000**		2			1			
Ardenwood Blvd	Tan Oak Dr		**$2,000**		2			1			
Ariel Rd	Deep Creek Rd	Emilia Ln	**$2,000**		2			1			
Bayside Pkwy	Landing Pkwy	W Warren Ave	**$2,000**		2			1			
Bayview Dr	Fremont Blvd		**$2,000**		2			1			
Blacow Rd	Garden Way		**$2,000**		2			1			
Blacow Rd	Gatewood St		**$2,000**		2			1			
Blacow Rd	Greenpark Dr		**$2,000**		2			1			
Blacow Rd	Keystone Dr		**$2,000**		2			1			
Blacow Rd	Mattos Ct	Mattos Dr	**$2,000**		2			1			
Bonde Way	Fremont Blvd		**$2,000**		2			1			
Bonner Ave	Mowry Ave		**$2,000**		2			1			
Bradley St	E Warren Ave		**$2,000**		2			1			
Bryant St	Bryant Ter	Washington Blvd	**$2,000**		2			1			
Cedar St	Mission Blvd		**$2,000**		2			1			
Central Ave	Joseph St		**$2,000**		2			1			
Central Ave	Teakwood Dr		**$2,000**		2			1			
Chapel Way	Irvington Ave		**$2,000**		2			1			
Chiltern Dr	Driscoll Rd		**$2,000**		2			1			
Clough Ave	Fremont Blvd		**$2,000**		2			1			
Coit Ave	Washington Blvd		**$2,000**		2			1			
Crandallwood Dr	Deep Creek Rd		**$2,000**		2			1			
Crestwood St	Fremont Blvd		**$2,000**		2			1			
Cushing Pkwy	Northport Loop E		**$2,000**		2			1			
Dalgo Rd	Mackintosh St	Mission Blvd	**$2,000**		2			1			
Deep Creek Rd	Falstaff Rd	Macbeth Ave	**$2,000**		2			1			
Driscoll Rd	Durillo Dr		**$2,000**		2			1			
Driscoll Rd	Joyce Ave		**$2,000**		2			1			
Driscoll Rd	Saint Anthony Dr		**$2,000**		2			1			
Dusterberry Way	Hansen Ave		**$2,000**		2			1			
E King Ave	King Ave	Mission Blvd	**$2,000**		2			1			
El Portal Ave	Niles Blvd	Plumeria Way	**$2,000**		2			1			
Fernald Street	Mohave Drive	Crawford Street	**$30,000**	6	6			0	3	3	
Fremont Blvd	Heritage Ter	Mattos Dr	**$2,000**		2			1			
Fremont Blvd	Margery Dr		**$2,000**		2			1			
Fremont Blvd	Michael Ave		**$2,000**		2			1			
Fremont Blvd	Norris Rd	Village Ter	**$2,000**		2			1			
Fremont Blvd	Parish Ave		**$2,000**		2			1			
G St	Niles Blvd		**$2,000**		2			1			
Godfrey Pl	Walnut Ave		**$2,000**		2			1			
H St	Niles Blvd		**$2,000**		2			1			
I St	Niles Blvd		**$2,000**		2			1			
Irvington Ave	Thurston St		**$2,000**		2			1			
Irvington Ave	Trimboli Way		**$2,000**		2			1			
J St	Niles Blvd		**$2,000**		2			1			
Jerome Ave	Washington Blvd		**$2,000**		2			1			
Joseph St	Peralta Blvd		**$2,000**		2			1			
Linda Dr	Niles Blvd		**$2,000**		2			1			
Maple St	Peralta Blvd		**$2,000**		2			1			
Mill Creek Rd	Mission Blvd	Starr St	**$2,000**		2			1			
Mowry Ave	Vancouver Cmn	Waterside Cir	**$2,000**		2			1			
Niles Blvd	Rancho Arroyo Pkwy		**$2,000**		2			1			
Niles Blvd	Rock Ave		**$2,000**		2			1			
Osgood Cmn	Osgood Rd		**$2,000**		2			1			
Paseo Padre Pkwy	S Grimmer Blvd		**$2,000**		2			1			
S Grimmer Blvd	Sage Ct		**$2,000**		2			1			
Washington Blvd	Olive Ave		**$2,000**		2			1			
			$305,200								

Note: Unit Costs Exclude Contingencies (20%) & Engineering Costs